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A Study on Electrocardiogram Changes in Organophosphorus Poisoning.

Ram Prasad[1], Harinath Reddy[1]
[1]Associate Prof. Kamineni Medical College, Narketpally, Telangana, India.

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ABSTRACT

Background: Organophosphate are one of the common pesticides in India most of the farmers use this pesticides in crop without taking proper precautions during in crops without taking proper precaution during spraying, so they are very much prom to accidental poising, both acute and chronic. Not only farmers but other population is also exposed to this Organophosphorus poisoning (Chronic) because of contamination of the vegetables and fruits with organo-phosphorous pesticides there are variety of chemical agents in this group. Most chemical warfare nerve agents such as GA (Tabun) GB (Sarin) Gd(Soman) are Organophosphate. Aim of study: To study the electrocardio graphic changes in organo-phosphorous poisoning and their relationship to the prognosis. **Methods:** We have conducted the study on 100 organo-phosphorous poisoning patients from Sep 2017 to Feb 2018 and analyzed the electrocardiographic changes accordingly. **Result:** Peak age incidence is 20-3o years during rainy season (June – October) Most common abnormality is QTC interval prolongation is 38% sinus tachycardia is due to nicotinic effect. **Conclusion:** ECG can be used as one of the prognostic factors while treating the O.P poising patients in emergency department

Keywords: Electrocardiogram (ECG), Organophosphorus poisoning, QTC intervals, Respiratory Failure.

INTRODUCTION

Agriculture is the main occupation in India 60%-70% population of India population depends on agriculture only. Increases used to pesticides contributes to the public health problems. In India organo-phosphorous pesticides are easily available in the market. Government is not having any control over the production and marketing of these pesticides. Cardiac complications are commonly associated with organo-phosphorous poisoning sometimes it may be fatal also.

MATERIALS AND METHODS

We have conducted the study an 100 organo-phosphorous poisoning cases patients with symptoms of COPD, caronary artery diseases, History of hypertension were excluded in this study person who are on drugs which can alter ECG changes also excluded 12 lead ECG and Rhythm strips was also taken . Electrocardiogram was taken 3 times in OP Poisoning cases. 1st ECG was taken at the time of admission, 2nd ECG was taken during hospital stay. 3rd and final ECG was taken at the time of discharge Different changes and variations were observed and tabulated. and these are correlated with patients prognosis.

Name & Address of Corresponding Author
Dr. Harinath Reddy
Associate Professor, Department of Medicine
Kamineni Medical College, Narketpally, Telangana, India.

RESULTS

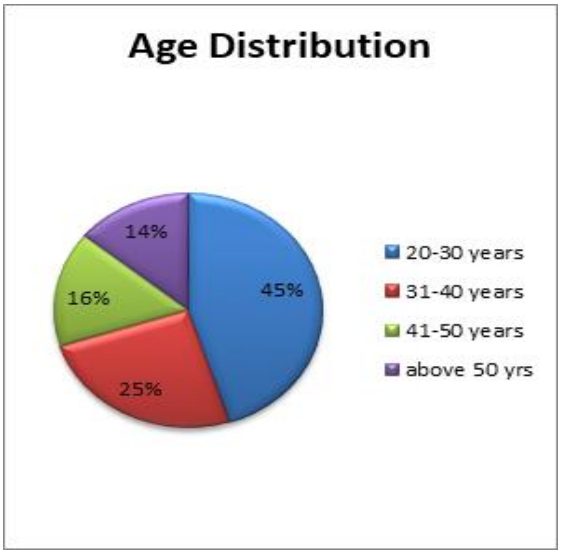


Table 1: Analysis of Age Distribution.

Age	Male	Female	Percentage
20 - 30 yr	25	20	45%
31 - 40 yr	15	10	25%
41 - 50 yr	9	7	16%
Above 50 Yr	8	6	14%

The changes of electrocardiogram in 100 organo-phosphorous poisoning were analyzed 3 ECG's for each patients were taken one at the time of admission, 2nd during hospital stay and 3rd are at the time of discharge Among 100 cases, 90 cases were suicidal and 10 cases were accidental poisoning. Organophosphorus poisoning is very common is young adults. and it is also common after 50 years because of decreased production of crops due to climate conditions i.e drought the incident is little higher in males.

Organophosphorus poisoning is common is rural areas where agriculture is main occupation. It is also common in the families with low socio-economic status. Different ECG changes like, QTC prognostic sinus tachycardia, Sinus Bradycardia and ST,T changes were observed. Among all these changes only QTC intervals is only important and has got prognostic importance in organo-phosphorous poisoning.

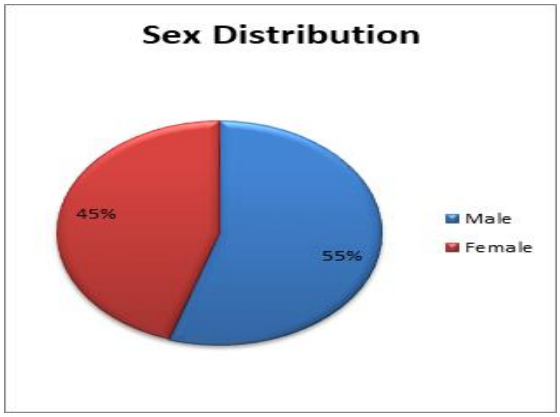


Table 2: Analysis of Sex Distribution

Gender	No of cases	Percentage
Male	55	55%
Female	45	45%

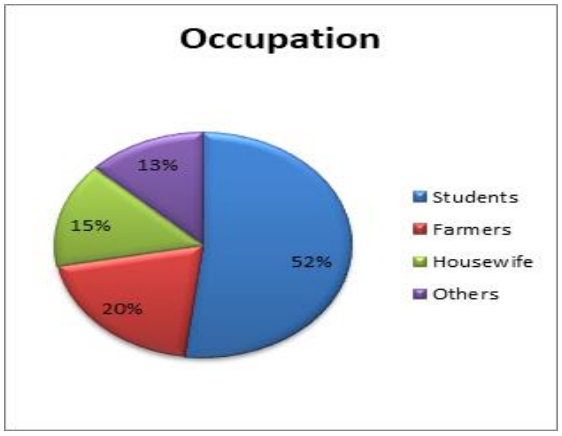


Table 3: Occupation of case study

Occupation	No of cases	Percentage
Students	52	52%
Farmers	20	20%
Housewife	15	15%
Others	13	13%

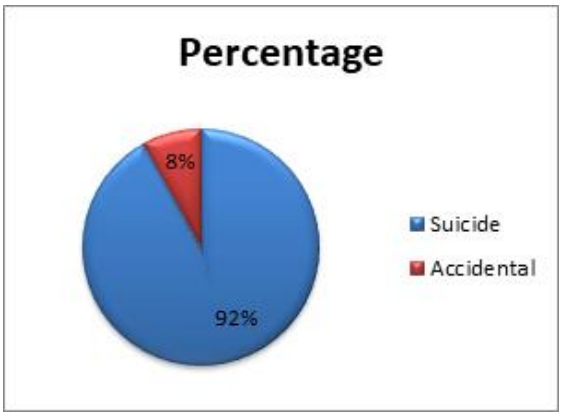
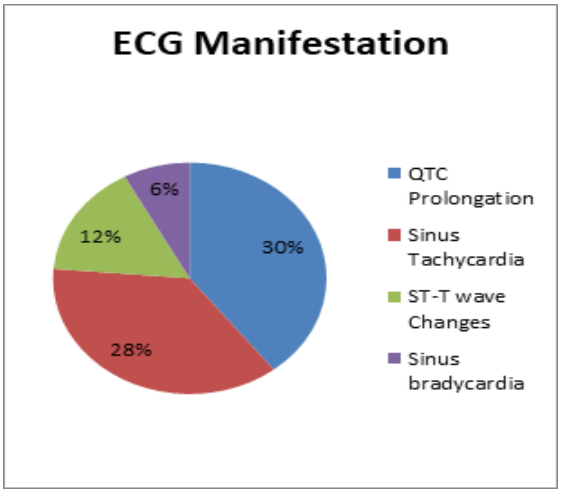


Table 4: Analysis of Motive behind the poisoning

Motive/Mode	No. of cases	Percentage
Suicidal	92	92%
Accidental	8	8%



ECG Manifestation	No. of Cases	Percentage	Mathur A et al	Mookherjee et al
QTC Prolongation	30	30%	35%	46%
Sinus Tachycardia	28	28%	85%	40%
ST-T wave Changes	12	12%	28%	-
Sinus bradycardia	6	6%	4%	29%

RESULTS & DISCUSSION

In India the season for agriculture activity is between June - July to Jan - Feb. It is mainly depends on monsoons. So the incidences of poisoning is more during this period and more than 90% of cases are suicidal. Accidental poisoning is around 5% only. In our study peak Incidence is seen in the age group between 20-30 years. male are 55% females are 45% Accidental poisoning is due to lack of preventive measures while spraying no proper training was given by manufacturing companies, marketing

agents and governments depts. like Agriculture vegetables and fruits venders are not taking proper precautions. In more than 75% patients are.

Mechanism of cardiac manifestation due to organo-phosphorous poisoning is not known exactly. Both sympathetic and parasympathetic over activity is implicated in myocardial damage.

The organo-phosphate compounds and organo-carbonate compound effects cardiac vascular system by hypoxemi, acidosis, electrolyte distributions and direct toxic effect on myocardium some investigators have described a polymorphic ventricular tachycardia of torsade depointes type attributes to prolongation of Q-TC intervals

In our study QTC prolongation is present in 38% hypertension and sinus tachycardia is due to nicotinic effect, while cholinergic manifestation are bradycardia and hypertension.[3]

Arrhythmias were observed in 48% patients similar observations by kiss and Fazekas et al is 70% and Saadeh Am et al in 67% of the patients. But In our study it is 30% and QTC prolongation is seen.

Ludomirsky reported that QTC prolongation is most common abnormality in acute organo-phosphorous poisoning.

These is no significant relation between QTC interval prolongation and severity of poisoning and mortality among these patients with prolongation QTC was 50% QTC prolongation indicates poor prognosis Chuang F R et al study shows similar results.[8]

Some study shows that Polymorphic ventricular tachycardia of 'torsadesde points ' attributed to QTC intervals prolongation associated with OP compound poisoning. The mechanism involved in ventricular tachycardia is believed to be imbalance between sympathetic and parasympathetic influences in cardio vascular system. In our study serum electrolytes were normal (Sodium and potassium). Sr. electrolytes were also normal in one study conducted by kiss et al. so the phenomenon of QTC prolongation is not related to Sr. electrolytes abnormalities.[7]

Sinus tachycardia is seen in 28% and sinus bradycardia is in 12% and ST. T changes were seen in 6% of patients. Many studies shows nonspecific ST. T changes in acute Organophosphorus poisoning. Mechanism involved is these changes may be due to hypoxia, parasympathetic over activity.

ST.T Changes include T wave inversion 8% ST, depression 12% , Flattening of T wave is 4% the studies conducted by p karkietal shows similar results.[5] Recent studies shows tachycardia is more frequent these bradycardia in Organophosphorus poisoning, This effect may be due to release of adrenaline and noradrenalin because of preganglionic receptor stimulation.

The study conducted by the Saadeh AM et al,[3] shows that sinus bradycardia is present in 28% where as sinus tachycardia present 35% patients of acute Organophosphorus poisoning may studies shows that sinus tachycardia is common than sinus bradycardia is acute Organophosphorus poisoning 5% patients were having conduction disturbances and presented as prolonged P.R Interval out of 100 Organophosphorus poisoning 15 patients were expired and electrocardiogram abnormalities were present in 10 patients Kiss observed in are study the ECG Changes Ie. Cardiac arrhythmias were seen in 1-20 days of expose of Organophosphorus poisoning.

CONCLUSION

Electrocardiogram can be used as one of the prognostic factors while treating the organophosphorus poising patients in emergency department. As QTC prolongation is most important change in ECG the other causes of prolonged QTC interval has to be evaluated.

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