STUDY OF SICK EUTHYROID SYNDROME IN ORGANOPHOSPHATE POISONING– A HOSPITAL BASED ONE YEAR CROSS SECTIONAL STUDY IN KLES' DR PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI

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The softcopy of thesis entitled: **"STUDY OF SICK EUTHYSOID SYNDROME IN ORGANOPHOSPHATE POISONING – A HOSPITAL BASED ONE YEAR CROSS SECTIONAL STUDY IN KLE'S DR. PRABHAKAR KORE HOSPITAL & MRC, BELAGAVI."** has been submitted for Anti-Plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of 04% which is within the acceptable limits of 10% as per the guidelines given by UGC.

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ABSTRACT

Background: Organoposphorus poisoning is one of the important case seen in the emergency department of hospital on day to day basis. Sick euthyroid syndrome is abnormal findings of thyroid function tests that occur among patients with non thyroid illness without having a history of hypothalmic pituitary dysfunction and malfunction of thyroid. Hypothyroidism with reduced level of hormones like T3(Triiodothyronine) is the prevalent thyroid dysfunction among acute illness of poisoning and can be detected in blood within 2 hours after the onset of severe muscular fatigue. As the disease progress there is severe manifestation of syndrome associated with hypothyroidism specially with T3 and T4 while, the level of TSH are slightly elevated or are not influenced. The Present study was carried out to assess the incidence of sick euthyroid syndrome in organophosphate poisoning as well to assess the socio demographic and clinical profile of patients with organophosphate poisoning.

Methodology: This was a Hospital based study carried out at Dr. Prabhakar Kore Hospital and Medical Research center Belagavi for period of one year from January to December 2020. Participants were patients with the history of Organophosphate poisoning and age above eighteen years. The sample size was calculated using the formula $N= 4pq/d^2$. Where N is the sample size, p is prevelance of diseases which is considered as 63.8 while q is 100-p and d is relative error of 10 percent. Hence the sample size was taken as 92. But due to prevailing COVID 19 pandemic only 74 patients with the history of organophosphate poisoning admitted at ICU were enrolled in the study after obtaining informed consent. Complete hemogram and thyroid profile of the patients were studied including assessment of gastric aspirates. Microsoft excel and SPSS 20 version was used for analysis of the data. The variable

are presented using frequency, percentage and standard deviation while association was assessed using chi square test and P value.

Results: Out of 74 patients majority of them were males (62%) in the age group of 21 to 30 years (42%). The major cause of poisoning was organophosphate (64%) followed by carbamates (15%). Ninety percent of exposure was through ingestion. The incidence of sick euthyroid syndrome with organophosphate poisoning was 53%. The mean serum cholinesterase in poisoning was 913±15.3. The factors which are statistically associated with sick euthyroidism were Male in the age group of 20 to 40 years. Low serum cholinesterase, no prior treatment, ECG changes and miosis.

Conclusion: Organophosphate poisoning is more common among young male in the age group of 20 to 40 years with suicidal tendencies. The incidence of sick euthyroid is quite high among patients with organophosphate poisoning hence biochemical markers and thyroid investigations leads to early diagnosis and prompt treatment in patients with organophosphate poisoning.

Keywords: Organophosphate, Poisoning, Euthyroid, Carbamates, Thyroid function test, Triiodothyronine, Thyroid stimulating hormone.

ABBREVIATIONS:

Ach	-	Acetylcholine
AChE	-	Acetyl Cholinesterase
AST	-	Aspartate Aminotransferase
CVS	-	Cardiovascular System
CPK	-	Creatine Phosphokinase
CNS	-	Central Nervous System
ECG	-	Electro Cardio Graph
FFP	-	Fresh frozen plasma
GIT	-	Gastro Intestinal Tract
ICU	-	Intensive Care Unit
I	-	Iodide
IU	-	International Units
NTI	-	Non thyroidal illness
OPC	-	Organophosphorus Compounds
PAM	-	Pralidoxime
RBC	-	Red Blood Cell
RBS	-	Random Blood Sugar
rT3	-	Reverse T3
T3	-	Triiodothyronine
T4	-	Thyroxine
TFT	-	Thyroid function tests
TSH	-	Thyroid stimulating hormone
WHO	-	World Health Organisation

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Agriculture or farming is the prime occupation in developing countries like India. Majority of the farmers use Organophosphorus compounds (OPC) as pesticides and insecticides in their fields to preserve their plants from various pests. Some of the farmers get accidentally exposed to organophosphorus compounds and get poisoned by it. It is also reported that some farmers use these compounds to commit suicide, as these OP compounds are easily available at their disposal.

Various compounds used in insecticides which can cause organophosphate poisoning are Parathion, diazinon, ethion, malathion, etc. Soman, sarin, tabun, as nerve gas poison. Organophosphorus Ophthalmic agents include echothiopate and isoflurophate. Anti-helminthic organophosphorus compound includes trichlorfon. The herbicides organophosphorus compounds include tribufos (DEF) and merphos. Dr. Gerhard Schrader was the German scientist, who first introduced parathion compound. The compounds which were used in World War-II for the first time are chemical warfare nerve gas agents like “sarin” and “tabun” which caused widespread damage were invented by him.

Acetylcholine is accumulated at the nerve synapses of receptors like nicotine and muscarine, due to blockage of acetylcholine esterase which inhibits breakdown of acetylcholine and thereby produces toxic manifestations because of excessive cholinergic stimulus. Patients with severe OP compound poisoning become symptomatic in 4 to 6 hours of exposure and poisoning is directly proportional with the quantum of pesticides particularly with organophosphate elements.

Serum cholinesterase is irreversibly inhibited by derivatives of phosphoric or phosphonic acid OPC compounds that results in cascades of events involving the muscarinic, nicotinic, and some receptors located in central nervous system. Electrolyte derangement, metabolic acidosis and hypoxia is seen and also toxicity on myocardial muscle and vascular system is also observed. Respiratory failure is the commonest cause of death.

In organophosphorus poisoning sick euthyroid syndrome is abnormal level of thyroid hormones in patients having no thyroid disorder without having a history of hypothalamic pituitary dysfunction and malfunction of thyroid.[1,2,3] Hypothyroidism with low level of T3(Triiodothyronine) is the prevalent thyroid dysfunction among acute illness of poisoning and observed within 2 hours of severe muscular fatigue.[4,5] With the progression of disease there is severe manifestation of syndrome associated with hypothyroidism specially with T3 and T4 while, the level of TSH are slightly elevated or are not influenced.

The decreased 5-deiodinase and synthesis of reverse T3 leads to reduction of thyroxine leading to increase in inactive metabolite. These endocrine changes are triggered at pituitary and hypothalamus by cytokines or inflammation through hepatic deiodinase and thyroid binding globulins. This nonthyroidal illness syndrome is whether an adaptive response which in turn decreases energy requirements at the tissue level during any systemic illness or a maladaptive response doing damage on the tissue still remains the mystery. There is growing evidence that organophosphate compounds, have biological properties that may influence thyroid function. Additional postulated mechanisms of pesticide-induced thyroid disruption include inhibition of iodine uptake, binding to transport proteins, interference with

deiodinases(iodothyronine) with increased clearance of thyroid hormone while thyroid gene expression interference causing impairment in cellular uptake.[6,7]

The current study was aimed to examine the effects of organophosphate poisoning on thyroid hormones which have the most important role in the determination of basal metabolic rate and maintaining the proper metabolism. This study is carried out as there are limited studies available globally regarding the effect of organophosphate poisoning and sick euthyroid.

OBJECTIVE

Primary Objective:

To study the incidence of sick euthyroid syndrome in organophosphate poisoning.

Secondary Objectives:

To assess the socio demographic profile of patients with organophosphate poisoning.

To assess the clinical profile of patients with organophosphate poisoning.

REVIEW OF LITERATURE

Organophosphorus chemical compounds are heterogenous chemical compounds which were mainly proposed to kill the pests, controlling weed growth and thus improve the yield in agriculture.

There are many numbers of compounds which are in use and considered indispensable in farming industry as the most economical, easily available and best chemical for pest control. Because of these starling features of these chemicals, they are rampantly used by farmers and often they fall prey to the organophosphorus poisoning. Many at times it is accidental and sometimes it is suicidal. Even though there are guidelines for use of such hazardous chemicals, yet due to sheer lack of awareness of handling such chemicals, people get affected and thus spoil their health. The role of such compounds is not just limited to agriculture, but is widely used chemical weapon in causing nerve damage in modern warfare. The example of such compounds includes tabun, sarin and soman. Some of them are used as plasticizers and as additives in lubricating oils and gasoline. Some of the organophosphorus compound finds their use in routine medical practice as the treatment drug for myasthenia gravis, treatment of eye disease like glaucoma etc.

TABLE 1: COMMON NAME AND TRADE NAME AVAILABLE IN MARKET[8]

S.No.	Common Name	Trade Name
1.	Acephate	Asataf, Orthene, Starthene
2.	Chlorpyrifos	Dursban, Durmet, Lorsban
3.	Dichlorvas	Noovan
4.	Dimethoate	Rogar, Tara909, Fosfamid
5.	Fenitrothian	Surmunion, Nitrophos
S.No.	**Common Name**	**Trade Name**
6.	Fenthion	Baycid, Baytex
7.	Malathion	Cythion, Chemathion
8.	Methyl Parathion	Metacid, Folitav,
9.	Monocrotophos	Monosron, Nuvacron, Luphos
10.	Phorate	Thimet, Pempart
11.	Parathion	Folidol, Ekatox
12.	Phosphomidan	Dimecron, Famfos
13.	Quinalphos	Ekalux

CLASSIFICATION

Organophosphorus compounds, sometimes known as anticholinesterases, are carbamic acid or phosphoric acid derivative chemical esters. Their group classification is based on chemical structure of carbamates and phosphates.

The carbamates and phosphates have their own general chemical formula which is as follows:

FIGURE 1: CARBAMATES[9]

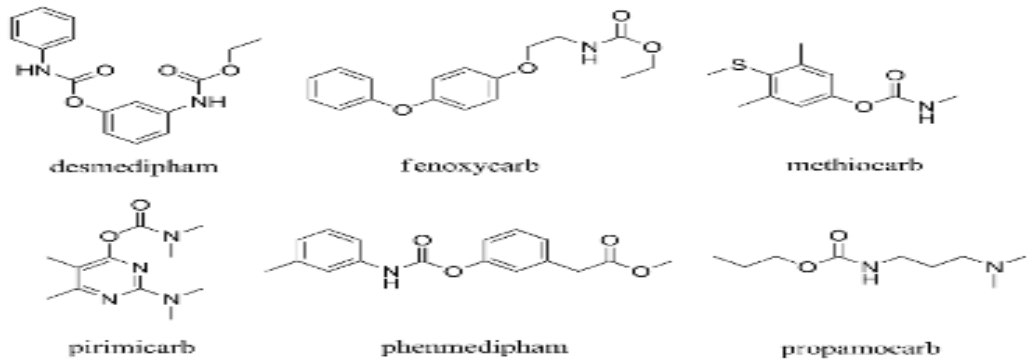
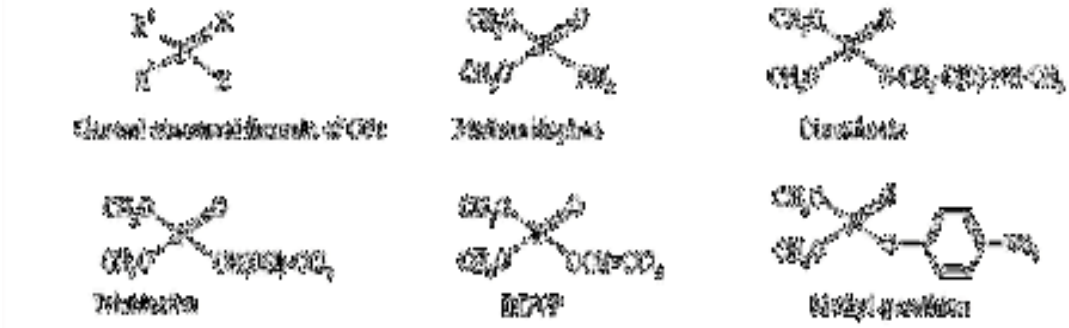


FIG 2: PHOSPHATES[10]



Carbamates can be further categorized as water soluble or lipid soluble molecules, depending on presence of a polar or nonpolar cluster at position R1. Except for ecothiopate, which is readily water soluble, most organophosphate chemical compounds have high lipid solubility. In case of poisoning by these chemicals, due to the nature of the compounds, they are easily distributed and deposited in adipose tissue.

DIMETHYL COMPOUNDS: Malathion, dichlorvos, fenthion, methamidophos, are the examples. In their structural image, at R1 and R2 there are 2 methyl groups in these compounds. The ageing of the enzyme complex is linked to the presence of these compounds. The most rapid ageing of enzyme can be caused by nerve gases and hence are most toxic compounds in all examples of organophosphorus compounds. Furthermore, they are classed as G agents, which are volatile and can be absorbed through inhalation or skin, depending on the route of poisoning. The G group of agents includes agents such as tabun, soman, and sarin. The V agents include VX, which is extremely toxic and are known as contact poisons.

MECHANISM OF ACTION: Acetylcholine is a neurotransmitter released by presynaptic neurons in the autonomic nervous system. Adrenal medulla is the place where Acetylcholine is released by presynaptic neurons and parasympathetic postsynaptic neurons at the neuromuscular junction.

FIG 3: ACETYLCHOLINE'S MECHANISM AT SYNAPTIC CLEFT[11]

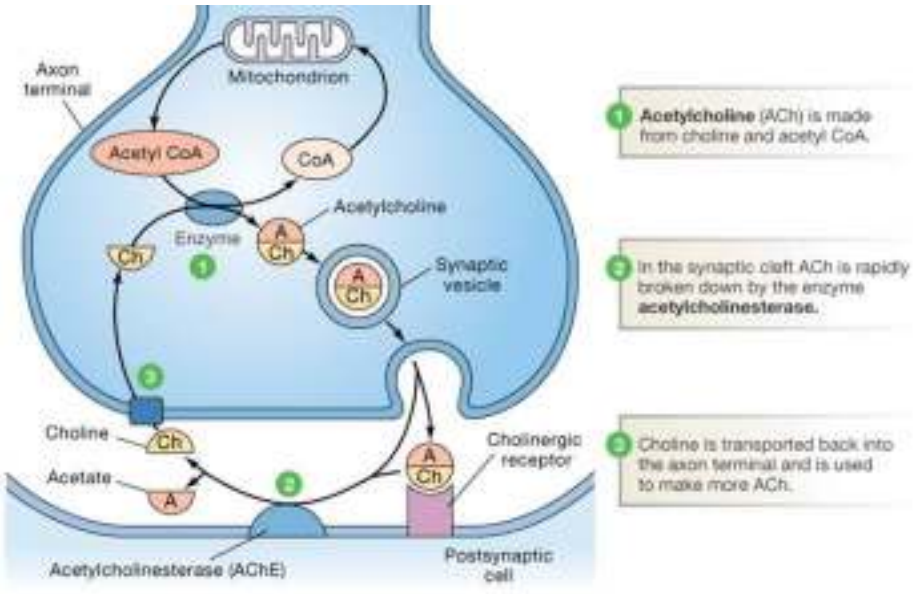
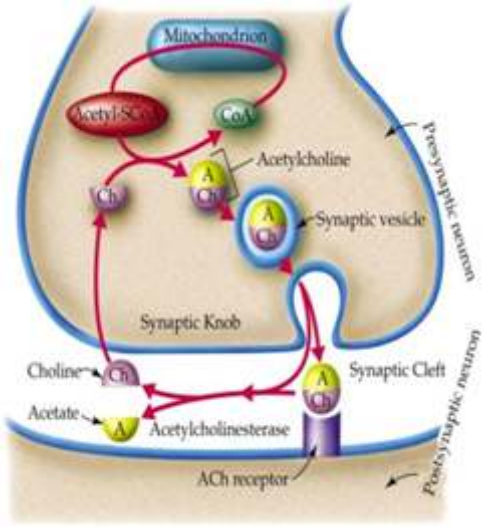


FIG 4: ACETYLCHOLINE DEGRADATION[11]



Interaction of choline (a serine derivative) and acetyl coA, which is stored in tiny vesicles, produces acetylcholine. The voltage gated calcium channels are active when presynaptic neurons are stimulated, causing calcium influx and acetylcholine release in the synaptic cleft. Acetylcholinesterase rapidly hydrolyzes acetylcholine and recycles choline back into the synaptic cleft. The two varieties of acetylcholinesterase found in the body are one pseudocholinesterase and second is true cholinesterase. True cholinesterase is specific to acetylcholine, whereas pseudocholinesterase is specific to butyrylcholine.

TABLE 2: FEATURE OF TRUE CHOLINESTERASE VS PSEUDO CHOLINESTERASE

FEATURE	PSEUDO CHOLINESTERASE	TRUE CHOLINESTERASE
Distribution	Plasma, liver, intestine, white matter	All cholinergic sites, RBCs, gray matter
Function	Hydrolysis of ingested esters	Termination of ach action
Inhibition	It is more sensitive to organophosphates	It is more sensitive to physostigmine
Action on acetylcholine	Slow	fast

Organophosphate chemicals cause toxicity by adhering tenaciously to the cholinesterase molecule at its active esteric site engaged in acetylcholine metabolism. As a result, all of these substances inhibit cholinesterase, prolonging and facilitating the actions of acetylcholine. As a result, the parasympathetic nervous system is overstimulated, and leads to disruption of action potential in peripheral as well as central nervous system.

KINETICS: Many factors influence kinetics, including distance from target organ, method of administration(inhalation, ingestion, , transmucosal exposure and transdermal) and local vs systemic metabolism. Each molecule has its own chemical structure in the group, as well as R-groups connected to the carbon, Sulphur or phosphorus entity, bond tightness to inner atom, and innate affinity for cholinesterase enzyme.[12] The chemicals are dispersed evenly throughout all tissues, with the liver and kidneys receiving the most after absorption. Lipophilic chemicals are concentrated at their highest levels in brain and adipose tissues. The plasma half-life following a single dosage varies on the kind of organophosphorus substance and the route of contact and can range from a several minutes to few hours. Metabolism is mostly accomplished through oxidation, esterase hydrolysis, and the transfer of a portion of the molecule to glutathione. In 48 hours, urine and faeces excretion occurs, with 80-90 percent of the compound being removed.[13] The majority of the agents exhibit symptoms and signs in six to ten hours.[14] Fat-soluble chemicals are an exception, taking many days to weeks to dissolve. Some substances should be activated into the toxic form. According to research, these metabolites can linger for days to weeks following therapy.[15]

The type of substance involved determines the outcome of the enzyme opc complex. This combination may then be hydrolyzed, followed by the resumption of

enzyme activity, which could take a few hours. The enzymes can be revived by using oximes. By breaking one oxygen-phosphorous connection, enzyme activity is permanently inactivated by some of these chemicals. Ageing is the term for this process. The ageing of an enzyme causes permanent damage that cannot be reverted back, even using oximes. As a result, the only way to restore enzyme function is to synthesize a new enzyme. Within the synaptic cleft, lack in the active enxyme form will cause the breakdown to be delayed.

TABLE 3: ACTION OF DIFFERENT MUSCARINIC RECEPTORS

Receptor	Target	Response
M1	Gastric glands, autonomic ganglia, CNS	Secretion of acid, depolarization, learning, motor function, memory
M2	Heart	Negative dromotropy- causes decrease in the conduction velocity via AV node Decreases heart rate
M3	Endothelium, glands, visceral smooth muscle.	Vasodilation, Visceral smooth muscle , exocrine glands secretion, ciliary muscle contraction
M4	CNS	Central activation
M5	CNS	Central activation

TABLE 4: NICOTINIC RECEPTORS AND THEIR ACTIONS

Receptor	Target	Response
N-m	Neuro muscular junction	Muscle contraction
N-n	Parasympathetic and Sympathetic ganglia, adrenal medulla, spinal cord	Depolarization - postganglionic impulse, catecholamine release in adrenal medulla

Organophosphorus chemicals' toxicological effects include both muscarinic and nicotinic actions. Muscarinic effects appear first, at exposure site specialy and are followed by central and nicotinic effects. These chemicals have the following effects system-wise:

1) CARDIOVASCULAR SYSTEM: Organophosphorus chemicals primarily affect heart rate and contraction force. Myocardial necrosis has been documented in the aftermath of acute poisoning, with increased creatine kinase and LDH levels. In the beginning, this causes tachycardia and hypertension, followed by hypotension and bradycardia. T waves of low amplitude, ST segment elevation, a prolonged QTc interval, a prolonged PR interval and extrasystoles are all common ECG abnormalities.

2) RESPIRATORY SYSTEM: Organophosphorus chemicals cause respiratory failure in the central nervous system. Distinguishing symptoms like rapidly progressive bradypnea followed by apnea because of absence of respiratory effort. This is caused by both respiratory muscle failure and a lack of central respiratory drive.

3) AUTONOMIC NERVOUS SYSTEM: The parasympathetic nervous system is primarily affected by these chemicals, resulting in an aggravation of all parasympathetic effects. Also, adrenal medulla causes an overabundance of catecholamines.

4) CENTRAL NERVOUS SYSTEM: Because acetylcholine is a primary neurotransmitter in the brain, organophosphorus chemicals induce catastrophic Central nervous system symptoms. Memory impairment, Parkinson's features, cerebellar symptoms, pseudobulbar signs, and different manifestations of neuropsychiatric disturbances are all examples of CNS abnormalities. The advent of intermediate syndrome is another CNS impact in 2 - 4 days followed by recovery

from the cholinergic crisis. This is primarily due to ineffective oxime therapy during the healing phase. Several cranial nerve palsies, as well as a loss of necrosis, characterize it.

5) HEPATIC SYSTEM: The detoxification and activation of these substances in liver is what causes the effects on the liver. Congestion of the liver, centrilobular necrosis, fatty changes, increased liver enzymes and sinusoidal dilatation are all symptoms.

6) GASTROINTESTINAL SYSTEM: Increased bowel motility caused by the cholinergic crisis causes abdominal cramps, nausea, vomiting, and diarrhea. Late-stage fecal incontinence is possible.

7) EXCRETORY SYSTEM: Chronically when exposed to these substances has been linked to the development of renal failure after a few years. There has also been some evidence of a link between chronic organophosphorus chemical toxicity and kidney cancers, particularly in youngsters. Urinary incontinence is a common side effect of this type of poisoning, especially in the elderly and children.

8) ENDOCRINE SYSTEM: Glycuria is caused by poisoning with organophosphate chemicals, which leads to the development of hyperglycemic conditions. This occurs as a result of a sudden increase in counter-regulatory hormones.

9) REPRODUCTIVE SYSTEM: Females who were poisoned with organophosphorus had abortions, according to reports. Numerous epidemiological and environmental research on hormone imbalance caused by pesticide exposure have been conducted and published.

10) EYES: In eyes, Miosis is the most common sign of acute poisoning. Pigmentary degeneration and myopia and of the retina may develop later on.

11) IMMUNE SYSTEM: Immune suppression is linked to severe stimulation of cholinergic system, either as a result of acetylcholine's direct influence or as a result of toxic chemical stress caused by cholinergic poisoning on the immune system.

12) IMPACT ON REGULATION OF TEMPERATURE: Organophosphorus poisoning can cause temperature derangement, which might manifest as hypothermia in some cases. Some people may have long-lasting fever spikes or possibly a biphasic response.

13) INTERACTIONS WITH JOINTS: A number of these organophosphate compounds can cause a nonspecific symmetrical arthritis that mostly affects the body's major joints, such as the hip and knee joints.

14) Some incidences of vocal cord paralysis have been documented within 2 to 3 days following exposure.

15) INTERNATIONAL EFFECTS: Organophosphorus chemicals have been discovered to lower glutathione levels in the body, resulting in increased oxidative stress. Above mentioned chemicals have also been discovered to obstruct oxidative metabolism in mitochondria, reducing ATP generation.

CLINICAL CRITERIA MODIFIED BY DREIBACH' - KARNIT [16]

GRADE I - Mild symptoms which are related to entry portal.
vomiting and nausea after ingestion burning sensation in the chest after inhalation ,Cough, mild symptoms like dizziness, headache and weakness

GRADE II - systematic intoxication of mode diarrhea and Pain abdomen after ingestion. Chest tightness Bradycardia, salivation, lacrimation, sweating, pupillary changes. confusion, tremor, restlessness

SEVERE SYSTEMIC INTOXICATION (GRADE III)- Generalized weakness, respiratory depression Cyanosis, peripheral circulatory failure, convulsions, and coma.

DIAGNOSTIC CRITERIA[17]

INVESTIGATORY MODALITES: CHOLINESTERASE LEVELS ESTIMATION: Clinical approaches are frequently used to identify organophosphate (OP) toxicity. Although both plasma cholinesterase, pseudocholinesterase levels can be employed, cholinesterase in RBC correlates better with acetyl cholinesterase in CNS, making it a more relevant organophosphate poisoning measure.

The estimation of cholinesterase levels in RBCs and plasma will offer a final analysis value, and it should be done before starting pralidoxime medication (2-PAM). A response to therapy can be determined by monitoring serial levels.

The enzyme RBC acetylcholine esterase, which is also found in neural tissue, is located on RBC membranes. As a result, the RBC acetylcholine esterase test is used.

One of the liver acute phase proteins is plasma cholinesterase which circulates freely in plasma and is found in various tissues including nerve tissue, CNS, pancreas and heart.

Many causes contribute to it, including pregnancy, infection, and other medical conditions. Furthermore, with repeated testing, some patients' levels can vary by up to 50%. Cholinesterase levels don’t always correlate well with clinical illness severity. The extent of activity of plasma cholinesterase is

relative and depends on estimated population. Infants and neonates have levels in baseline which are much less as compared to adults. Because many of the patients are unaware of their baseline normal level, diagnosis is frequently verified by tracking a gradual rise in the level of cholinesterase value until it reaches a plateau.

False low erythrocyte cholinesterase level might be detected in certain clinical conditions like pernicious anemia, hemoglobinopathies and also by the use of antimalarials. Falsely decreased in the levels of cholinesterase in plasma are observed in low- protein conditions, liver dysfunction, neoplasia, usage of certain drugs (succinylcholine, codeine and morphine), hypersensitivity reactions, genetic deficiencies and pregnancy.

STUDIES ON IMAGING: A chest xray might reveal lung edema but it doesn't affect much of a poisoned one in its clinical management. ECG findings contains ST elevation, Q-T prolongation, PR interval prolongation and T wave inversion. There might also be abnormalities in rhytm like ventricular ventricular tachycardia, extra-systoles, , sinus fibrillation and bradycardia. Cardiac toxicity described in three phases by one of the studies after organophosphate poisoning:

Phase I: Increased sympathetic tone for a brief period.

Phase II: Parasympathetic activity is prolonged including AV node blockade

Phase III: torsades de pointes, Q-T prolongation, arrhythmia and ventricular tachycardia.[18]

THERAPEUTIC CONSIDERATIONS

Medical Care: In organophosphate poisonings, airway management and proper oxygenation are critical. In some circumstances, respiratory intubation may be required, depending on the severity of bronchospasm, laryngospasm, or seizures. The instant use of atropine may avoid need for intubation. [19] Because succinylcholine is metabolized by acetyl cholinesterase and can induce prolonged paralysis, it should be avoided.

Continuous cardiac monitoring and pulse oximetry are required, as well as the recording of an ECG. Torsades de Pointes should be dealt with in the proper way. Some studies have shown that magnesium sulphate if given intravenously would be helpful in organophosphorus toxicity.[20] Acetylcholine antagonism or ventricular membrane stability may be involved in the mechanism of action.

All the clothing must be removed and kept far away from the poisoned individual and the skin surface must be washed by using soap and water judiciously. Adequate care must be taken to discard the clothing considering it as hazardous waste.

When working with patients, health care staff must avoid becoming contaminated. When decontaminating patients, wearing personal protective apparatus like nitrile gloves, neoprene and gowns is strongly suggested since hydrocarbons are able to enter non-polar substances like vinyl and latex. When decontaminating patients who are heavily contaminated, charcoal cartridge masks are required for respiratory protection. Isotonic saline should be used to adequately wash the eyes of individuals who have had ocular exposure. If ingestion happened within 1 hour, a nasogastric tube should be placed and activated carbon (charcoal) in a dose of 1g/kg orally should be administered for

stomach wash.[21] Atropine administration: For successful atropinisation, 3-5mg fast intravenous should be given. Five factors are used to determine whether atropinisation is adequate.

1. More than 80 beats per minute heart rate
2. More than 80mm Hg Systolic BP
3. No crackles on respiratory examination
4. Dry axilla
5. Pupils are not constricted [22]

If the following parameters do not appear to be achieved after 5 minutes, double the starting dose. Atropine is given in a pattern of doubling dose until atropinisation is achieved.

Atropinisation should be maintained by administering 10-20% of the bolus dosage as an infusion in 100 mL of normal saline every quarter hour and evaluating the parameters. If atropinisation is insufficient, a superimposed bolus of 3 to 5 mg should be delivered. Atropine should be tapered down every hourly for the first 6 hours and then every 2 hours for the coming 24 hours. Atropine toxicity symptoms such as agitation, confusion, bladder retention, heat, and tachycardia should be carefully monitored.

Atropine can be replaced with glycopyrrolate. It has no effect on the heart rate.[23]

OXIMES: PRALIDOXIME (2-PAM OR PROTO PAM) [24]

Cholinesterase reactivation

The nucleophilic oximes bind to organophosphorus molecule and cause reactivation of the phosphorylated acetylcholinesterase. For the past two decades, the use of oximes in

acute organophosphorus poisoning has been a contentious topic, with few of the randomized controlled trials addressing the role of PAM.

Pralidoxime works in following ways:

- A transient response that protects the enzyme from further inhibition by converting the organophosphate to a nontoxic molecule.
- Reactivation of an alkyl phosphorylated enzyme that has been inhibited in order to release the active unit.

The important reactivation action of PAM is most distinctly seen at the nicotinic skeletal myoneural junction; however, the muscarinic actions are not reversed which are caused due to organophosphorus poisoning. Pralidoxime should be started as soon as possible to avoid the organophosphate's permanent binding to acetyl cholinesterase. Receptor regeneration is essential once this has occurred in order to allow recovery. The recommended PAM dosage is 500 milligrams per hour as an infusion for the first two days, then 1 gm in tds for the next three days. It must be continued until the poisoned patient's spontaneous ventilation returns. Because the effective serum concentration is 4mg/liter, the patient should start to feel better 10-40 minutes after taking it. Drowsiness nausea, weakness and tachycardia are the commonest side effects with PAM. Hence judicious and careful use is advised for near deadly cases. FFP also can be employed in the treatment of OPC.[25]

Sick euthyroid syndrome is an abnormal finding on TFT that occur within the limits of a non thyroidal illness without preexisting thyroid gland dysfunction and hypothalamic-pituitary disease.

The most common aberrant finding of thyroid function in patients with acute sickness is a reduction in serum total triiodothyronine (T3), which can be observed

within 2 hours of the onset of physical stress of severe type. Since its severity progresses, there's slow initiation of complex syndrome related with low levels of T4 and T3. Levels of thyroid stimulating hormone remain unchanged. The conversion of the T4 to its active form is diminished. This happens due to diminished 5'-deiodinase activities peripherally and production of rT3. These endocrine changes are also mediated by inflammatory mediators like cytokines, engaging at the extent of the hypothalamo-pituitary axis. It is still not clear whether sick euthyroid syndrome's hormone changes represent an adaptation to the organophosphorus poisoning response. Such changes lower energy requirement by the tissue at the start of any major systemic illness. Recovery from the underlying illness is typically accompanied by correction of the thyroid abnormalities. Abnormal thyroid hormone levels are reported in cases of starvation, acute and chronic medical illnesses, bone marrow transplantation, surgery, trauma, infarction and, in fact, are often seen in many other severe systemic illnesses.[26]

SYNTHESIS OF THYROID HORMONES:

Thyroid hormones are synthesized differently. Thyroid follicles function as a factory for producing thyroid hormones as well as a warehouse for storing them.

There are 3 major steps in production of this hormone. The first phase is the production and buildup of raw materials for thyroid hormone synthesis. Next is that the process of synthesis of the hormones on a precursor molecule and ultimately the liberation of the free hormones from the thyroid gland into blood follows.

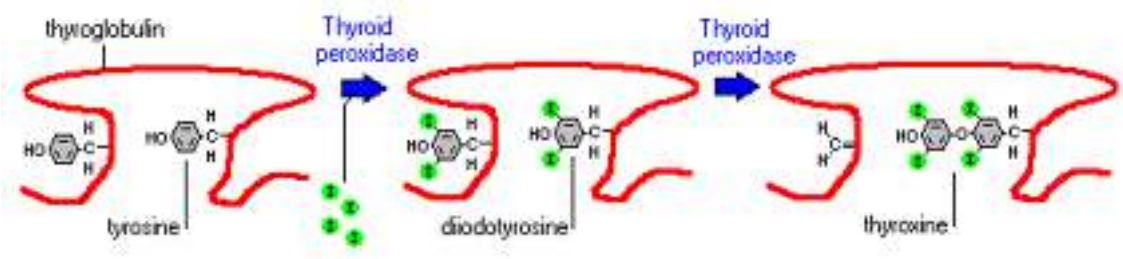
Tyrosine amino acids are obtained from thyroglobulin which is a relatively large size glycoprotein. It is synthesized within the lumen of the thyroid follicle by epithelial cells. Colloid is basically a pool of thyroglobulin. A molecule of thyroglobulin contains 134 tyrosines, out of which only some molecules are taken up for synthesizing T3 and T4.

A sodium-iodide symporter, often known as the "iodine trap," actively uptakes iodine, or more precisely iodide (I-), from the blood by thyroid epithelial cells. The iodide molecule, together with thyroglobulin, is carried within the thyroid follicular lumen once within the cell. Thyroid hormones are produced by the enzyme thyroid peroxidase, which is found in the apical cytomembrane of thyroid epithelial cells and is an integral membrane protein. Thyroid peroxidase is involved in two sequential reactions:

a. Tyrosine iodination on thyroglobulin.

b. From two iodotyrosines, thyroxine or triiodothyronine is synthesized.

FIGURE 5: SYNTHESIS OF THYROXIN[27]

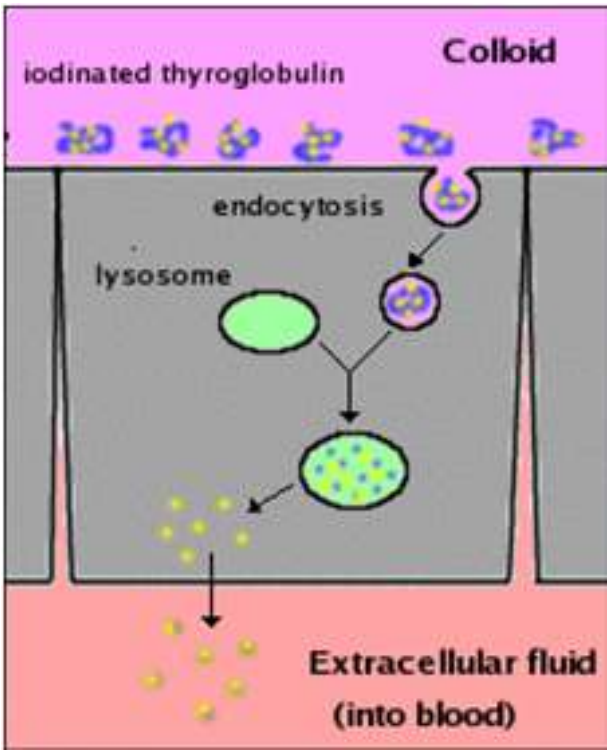


By the thyroid peroxides action, the thyroid hormone gets accumulated in the colloid.

SECRETION OF THYROID HORMONES: The following steps are involved in thyroid hormone secretion: Colloid is taken up by thyroid epithelial cells by endocytosis from their apical borders at first. The endosome is made up of thyroglobulin and thyroid hormone. The endosome then joins the lysosomes, which contain potent hydrolytic enzymes that break down thyroglobulin and release the free hormone.

Finally, unbound thyroid hormones appear to flow from lysosomes into the bloodstream via the cell's basal semipermeable membrane, where they readily attach to carrier proteins for further transport and activity.

FIGURE 6: SECRETION OF THYROID HORMONE[27]



Synthesis and Secretion of Thyroid Hormones:

Thyrotropin, which is secreted from the anterior pituitary, stimulates each of these activities. The synthesis of iodine transporter and thyroid peroxidase is triggered by epithelial cell stimulation caused by thyrotropin binding. The magnitude of the TSH signal also determines the rate of colloid endocytosis. Thyroid stimulating hormone (TSH) in high quantities causes a higher rate of endocytosis and, as a result, thyroid hormone release into the circulation. TSH levels that are too low, on the other hand, cause hormone production to be reduced. [27]

MATERIALS AND METHODS

Study Design: Hospital based cross sectional study.

Study Settings: The cases were patients admitted within the wards and ICU Department of Internal Medicine at KLES Dr. Prabhakar Kore Hospital and Medical Research Center, Belagavi.

Study Duration: One year from 1st January 2020 to 31st December 2020.

Inclusion Criteria:

- Adults above the age of 18 years with the history and clinical features implicative of organophosphate poisoning
- Patients with low cholinesterase levels.

Exclusion Criteria:

- Patients with past or present history of thyroid dysfunction.
- On medication that interact with thyroid function.
- Poisoning aside from organophosphate.
- Abnormal liver function test at the time of admission.
- Deranged renal function test during admission.
- Patient in sepsis.

Sample Size:

The sample size was evaluated using the below formula

$N= 4pq/d^2$ where

N= sample size

p= Prevalence of the diseases (63.8%).[28]

q= 100-p

d= relative error 10%

Hence n= 4* 63.8* 36.2/100 = 92.38

92 cases who fit the inclusion criteria were to be taken for the study.

This could not happen because of COVID 19 pandemic. Hence only 74 individuals who fit the inclusion criteria were taken in the study.

Methodology:

Patients admitted in wards and ICU of Internal Medicine Department at KLES hospital and medical research Centre, Belagavi with the history and clinical features implicative organophosphate poisoning were included within the study after obtaining ethical clearance from the institutional ethical committee and consent from the patients.

Blood samples were collected under all aseptic precautions and sent to the laboratory for thyroid profile- TSH, total T3, T4 and serum cholinesterase. While the Gastric aspirate was collected by suction using ryles tube and analyzed by thin layer chromatography method for detection of poisonous compound.

Thyroid profile was interpreted as per the quality guidelines.

TSH: 0.51 to 4.3 mcIU/ml (12 to twenty years) and 0.27 to 4.2mcIU/ml (21 to 120 years)

T3: 0.8 to 2.0 ng/ml

T4: 5.1 to 14.1 mcg/dl

Serum cholinesterase level: 3167-6333U/L

Patients with the known history of organophosphate poisoning were included within the study. The reliability of the exposure was assessed by comprehensive enquiry about exposure from individuals or close attendants. The kind and quantity of the poison was assessed by studying the container and also the patients underwent detailed investigation using the pre tested proforma. All the patients were subjected to baseline laboratory investigations and gastric aspirate by thin layer chromatography

for detection of poison. All the patients underwent detailed investigations like complete Hemogram, liver function test, renal function test, ECG, thyroid function test and serum cholinesterase.

Cholinesterase was assessed by Kinetic colorimetric method, SGOT by UV Kinetic method while SGPT by Modified IFCC method.[29,30]

Statistical Analysis:

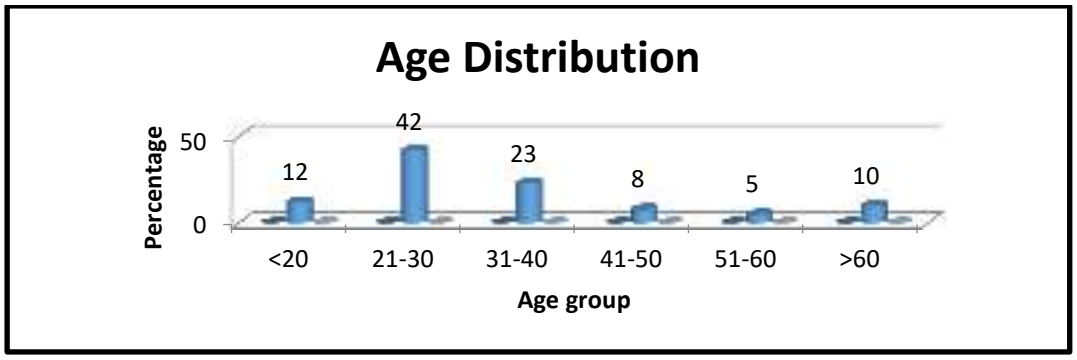
The statistical analysis was done using Microsoft excel and SPSS 20 version. The explicit variables are presented in frequency and percentage while continuous date is presented in mean± variance. The association between the variable was analyzed using chi square test and P value. The P value of less than 0.05 was considered as significant.

RESULTS

The present study assessed 74 patients admitted in wards and ICU department of internal medicine at KLE Dr. Prabhakar Kore Hospital and medical research center, Belagavi who fit into the inclusion criteria after obtaining consent.

TABLE 1: Distribution of cases according to age group

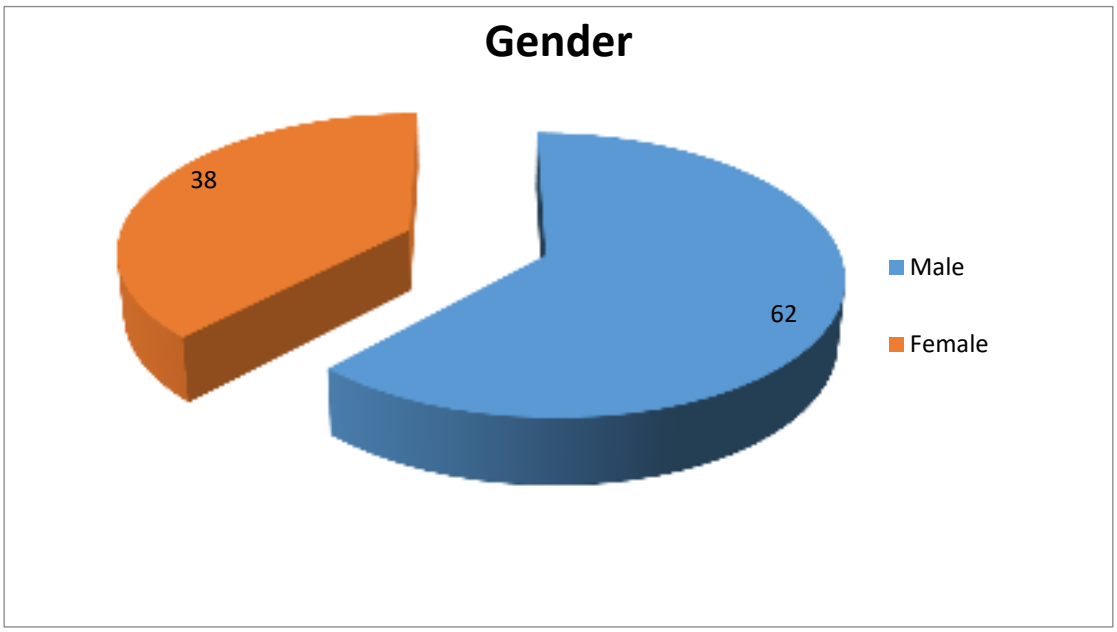
Age Group	Frequency	Percent
≤20	**9**	**12**
21-30	**31**	**42**
31-40	**17**	**23**
41-50	**6**	**8**
51-60	**4**	**5**
>60	**7**	**10**
Total	**74**	**100**



Majority of the patients belonged to people of 21-30 years 31 (42%) followed by 31-40 years 17 (23%), <20 years 9 (12%), >60 years 7 (10%), 41-50 years 6 (8%) and also the least within the age bracket 51-60 years 4 (5%). The mean age of the cases was 34.4±15.9

TABLE 2: Distribution of cases according to gender

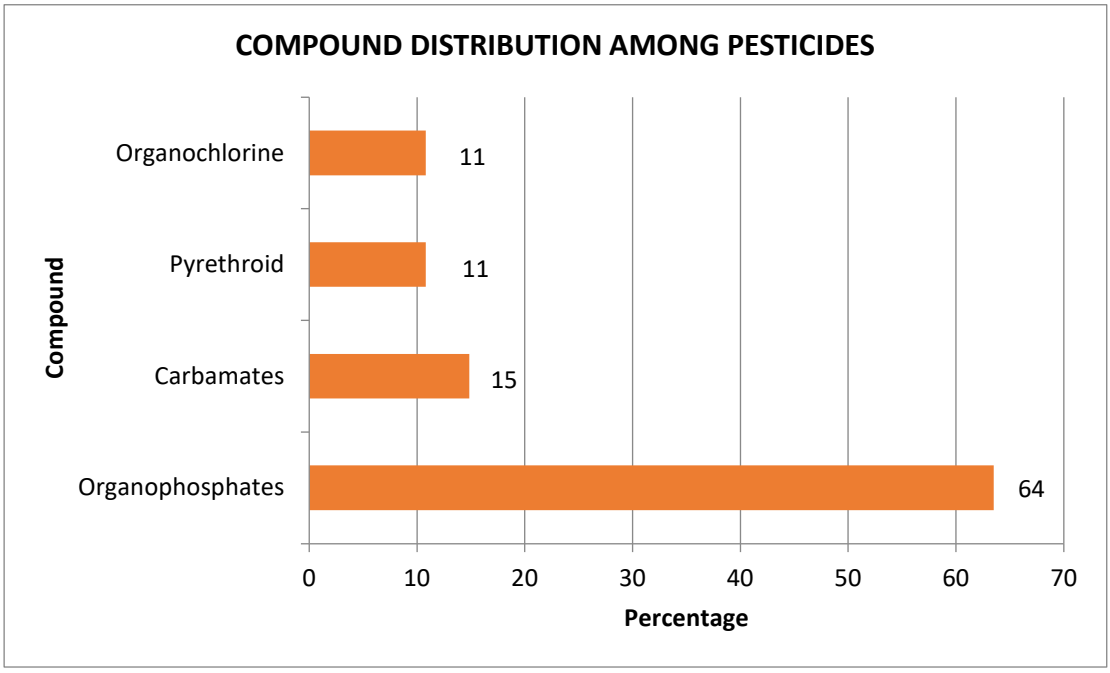
Gender	Frequency	Percentage
Male	**46**	**62**
Female	**28**	**38**
Total	**74**	**100**



The study shows majority of the cases were male comprising of 46 (62%) as compared to female 28 (38%).

TABLE 3: Distribution of cases according to Compounds of pesticides.

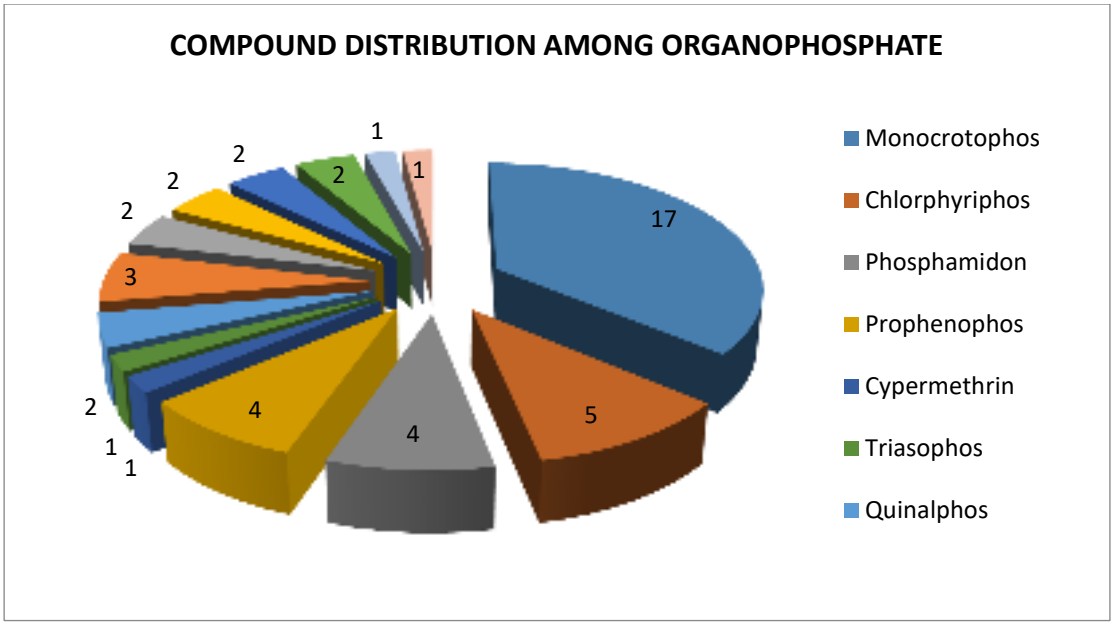
Compound distribution among pesticide	Frequency	Percentage
Organophosphates	**47**	**64**
Carbamates	**11**	**15**
Pyrethroid	**8**	**11**
Organochlorine	**8**	**11**
Total	**74**	**100**



As per the compound distribution of cases, organophosphate (64%) contributed the key cases followed by carbamates (15%), pyrethroid (11%) and organochlorine (11%).

TABLE 4: Distribution of cases according to compound among organophosphate

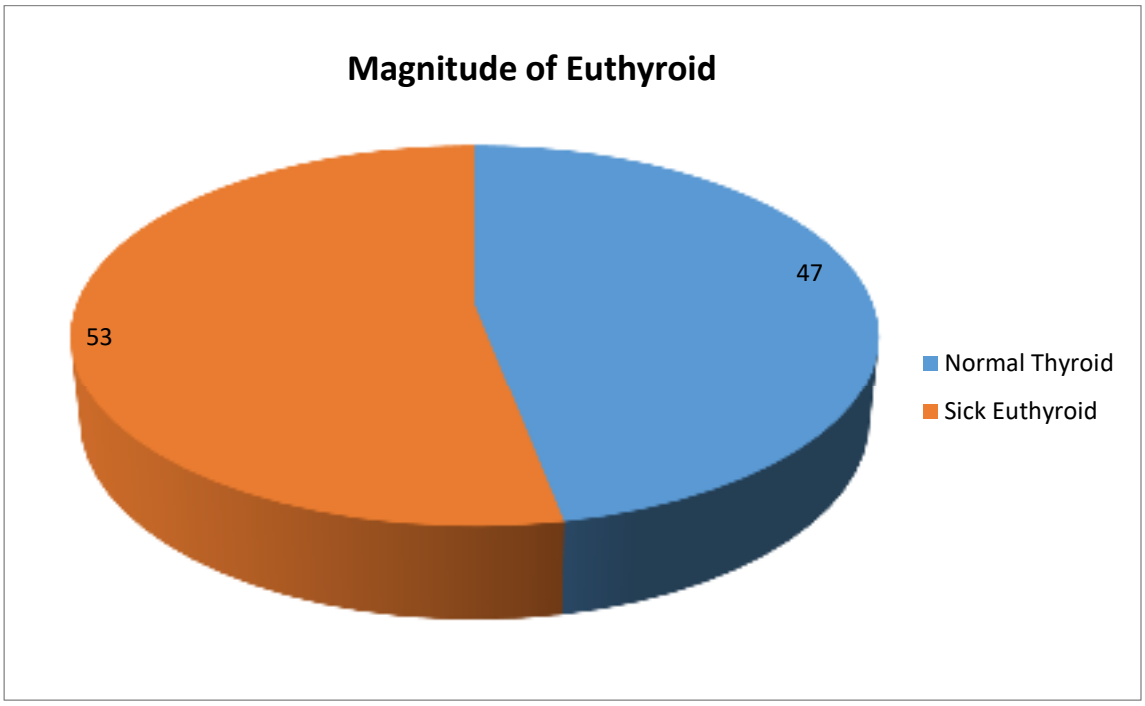
Compound distribution among organophosphate	Frequency	Percentage
Monocrotophos	17	36
Chlorphyriphos	5	11
Phosphamidon	4	9
Prophenophos	4	9
Chlorphyriphos	3	6
Quinalphos	2	4
cypermethrin	2	4
Methylparathion	2	4
Prophenophos	2	4
Compound distribution among organophosphate	**Frequency**	**Percentage**
Ethylparathion	2	4
Cypermethrin	1	2
Triasophos	1	2
Dimethoate	1	2
Parathio	1	2
TOTAL	47	100



As per the compound of organophosphate distribution majority affected had Monocrotophos(36%) followed by chlorpyriphos(11%), Phosphamidons(9%), Prophenophos(9%) et al.

TABLE 5: Distribution of cases according to magnitude of Euthyroid.

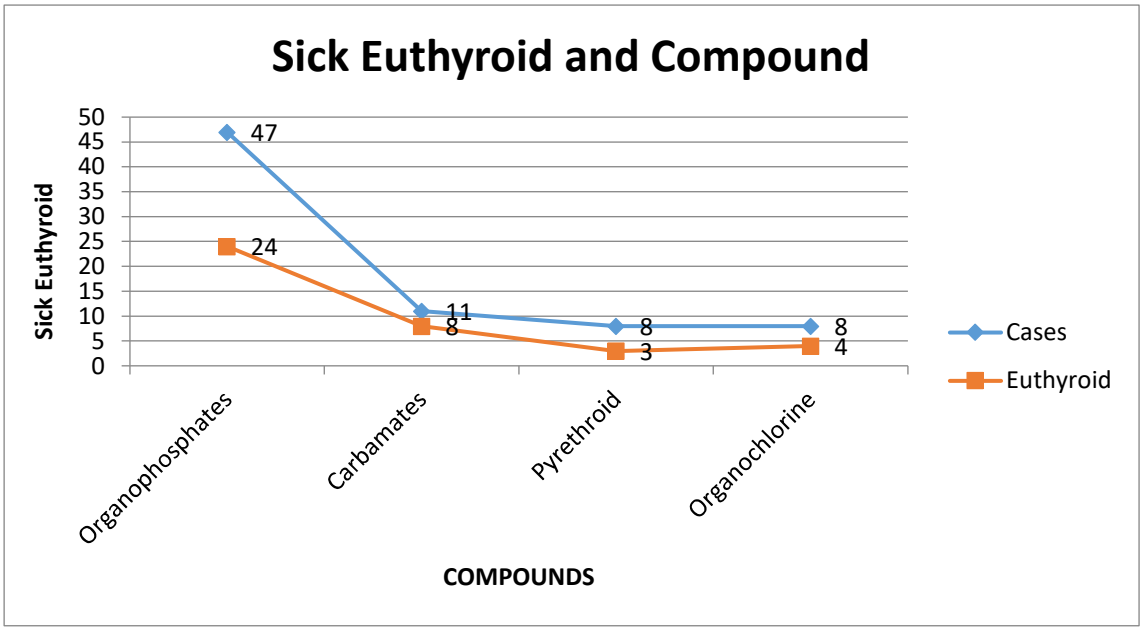
Magnitude of Euthyroid	Frequency	Percentage
Normal Thyroid	35	47
Sick Euthyroid	39	53
Total	74	100



As per the distribution of cases in step with thyroid status, 35(47%) had normal thyroid while 39(53%) of the organophosphate poisoning patients had sick euthyroid.

TABLE 6: Distribution of cases supported the incidence of sick euthyroid among different organophosphate compounds.

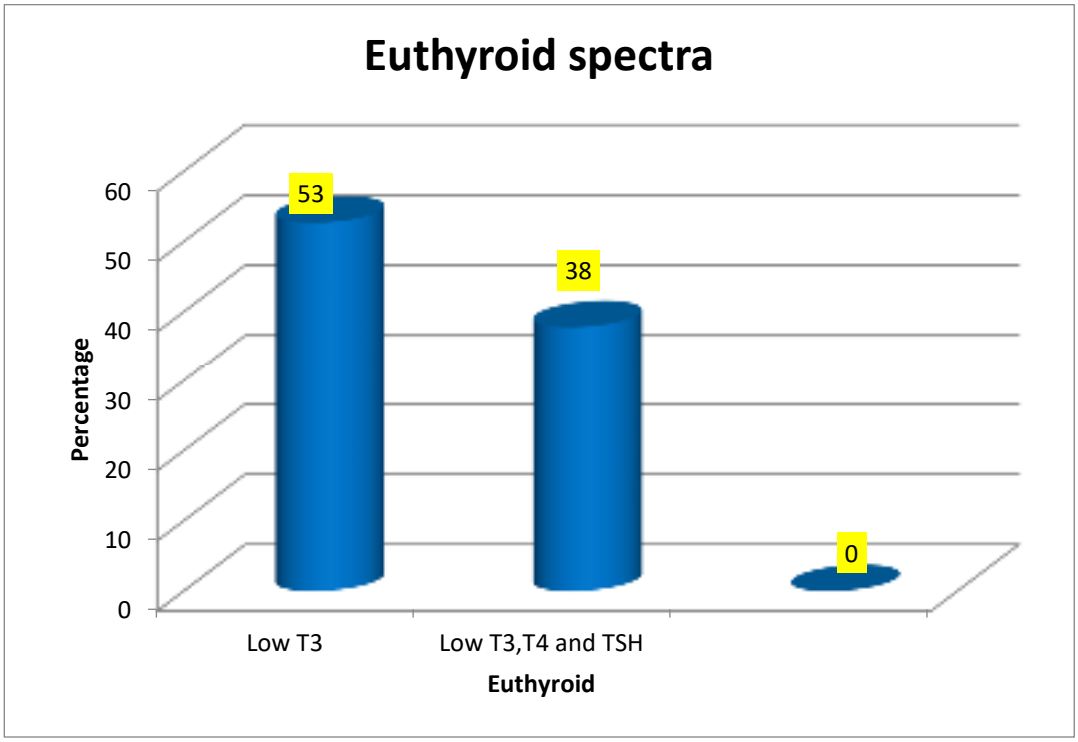
Compound with Thyroid status	Cases	Sick Euthyroid	Percentage
Organophosphates	47	24	62
Carbamates	11	8	21
Compound with Thyroid status	**Cases**	**Sick Euthyroid**	**Percentage**
Pyrethroid	8	3	8
Organochlorine	8	4	10
Total	74	39	100



Out of 74 cases, the incidence of sick euthyroid among different compounds was organophosphates (62%), carbamates (21%), organochlorine (10%) and pyrethroid (8%) respectively.

TABLE 7: Distribution of cases in step with the sick euthyroid

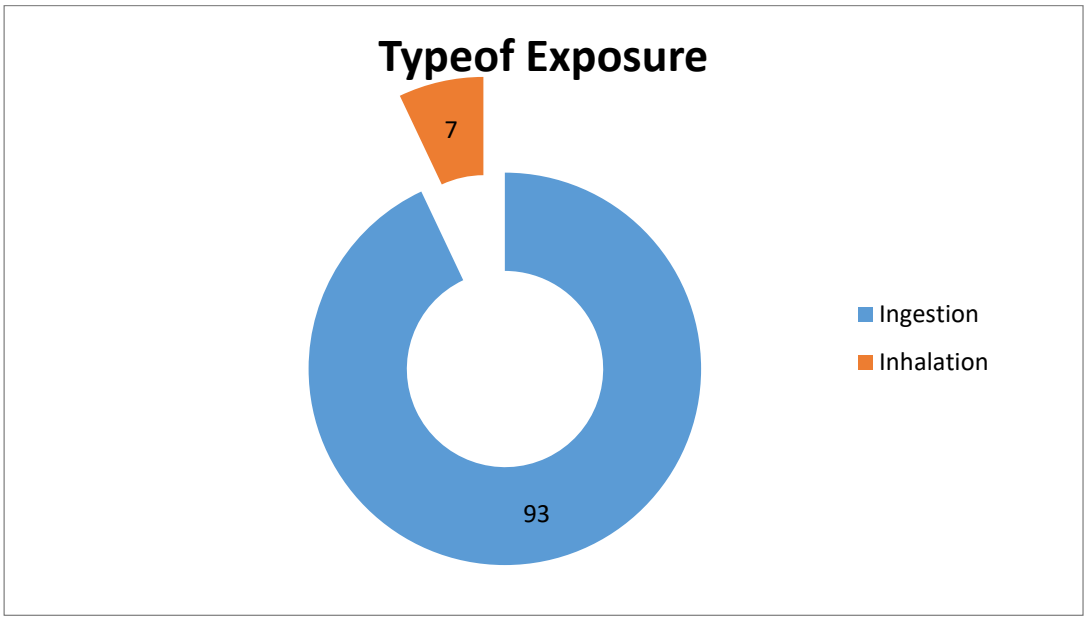
Euthyroid	Frequency	Percentage
Low T3	39	53
Low T3, T4,TSH	28	37



Out of the entire 74 cases, 39 (53%) of the cases had low T3 followed by Low T3, T4 and TSH 28(38%) respectively.

TABLE 8: Distribution of cases with the type of exposure

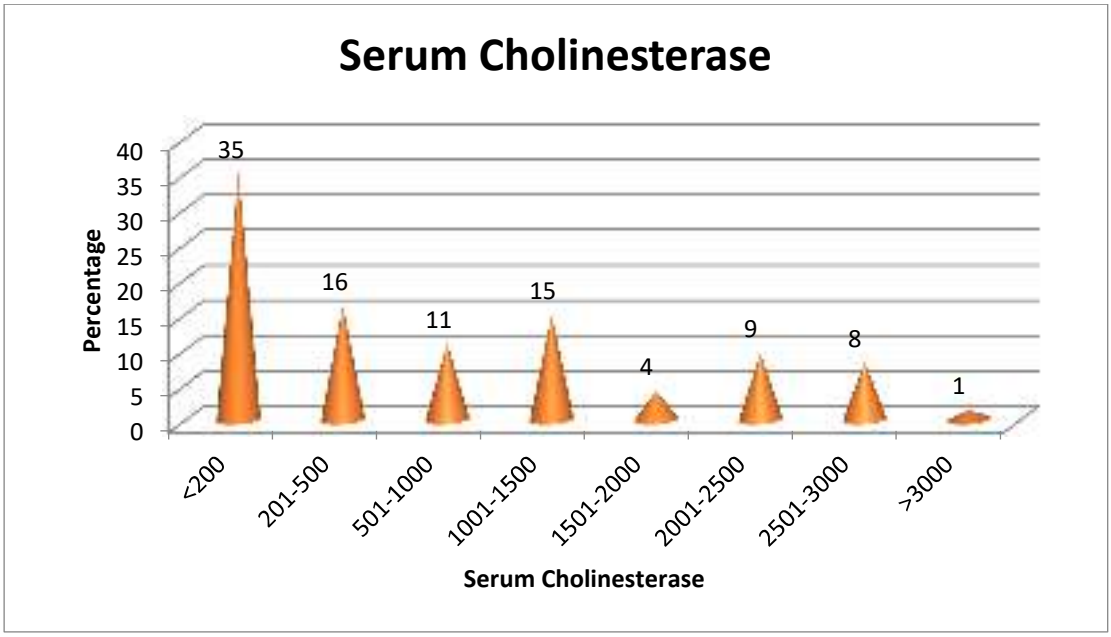
Type of exposure	Frequency	Percentage
Ingestion	**69**	**93**
Inhalation	**5**	**7**
Total	**74**	**100**



Out of 74 cases of organophosphate poisoning, majority of cases 69(93%) had cause being ingestion while 5(7%) had inhalation route of poisoning.

TABLE 9: Distribution of cases as per serum cholinesterase level

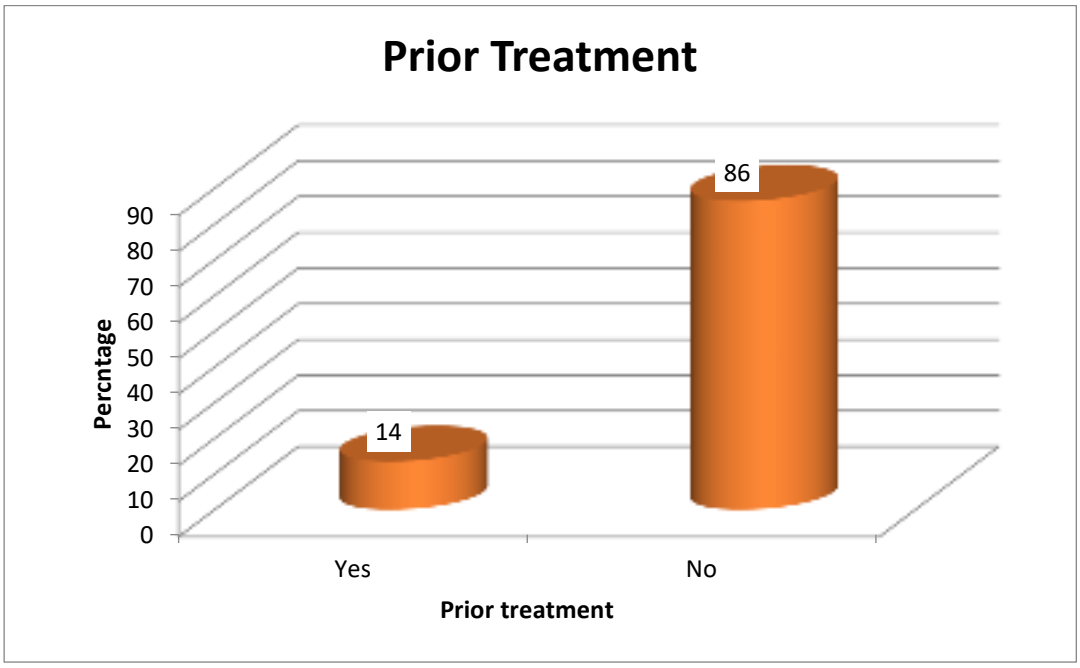
Level of Cholinesterase	Number	Percentage
<200	26	35
201-500	12	16
501-1000	8	11
1001-1500	11	15
1501-2000	3	4
2001-2500	7	9
2501-3000	6	8
>3000	1	1
Total	74	100



The results show that low serum cholinesterase was seen among all the patients with organophosphate poisoning. Majority 26 (35%) of individuals with organophosphate poisoning had serum cholinesterase level of <200 followed by 201-500, 501-1000 and 1001-1500 which were 16%, 11% and 15% respectively. Serum cholinesterase level of 1501 to 3000 was seen among 16 individuals. None of the cases had serum cholinesterase level above the normal range of above 3167. The mean cholinesterase was 913.2±15.3 IU/L among organophosphate poisoning.

TABLE 10: Distribution of cases as per prior treatment.

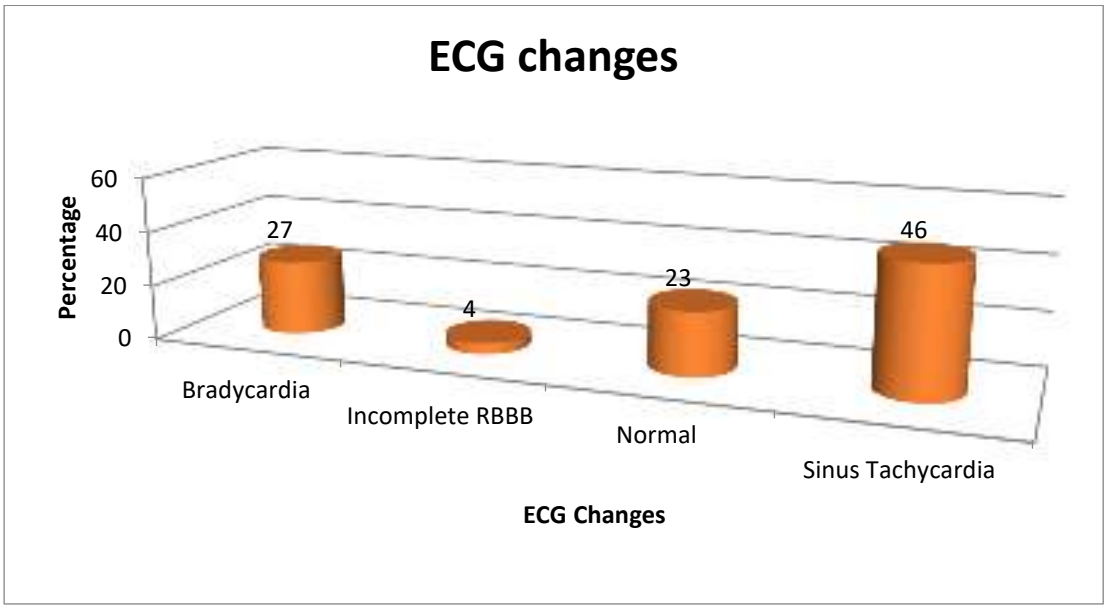
Prior Treatment	Frequency	Percentage
Yes	**10**	**14**
No	**64**	**86**
Total	**74**	**100**



Out of 74 cases the results showed that majority of the cases that's 64(86%) had no history of prior treatment.

TABLE 11: Distribution of cases as per ECG changes.

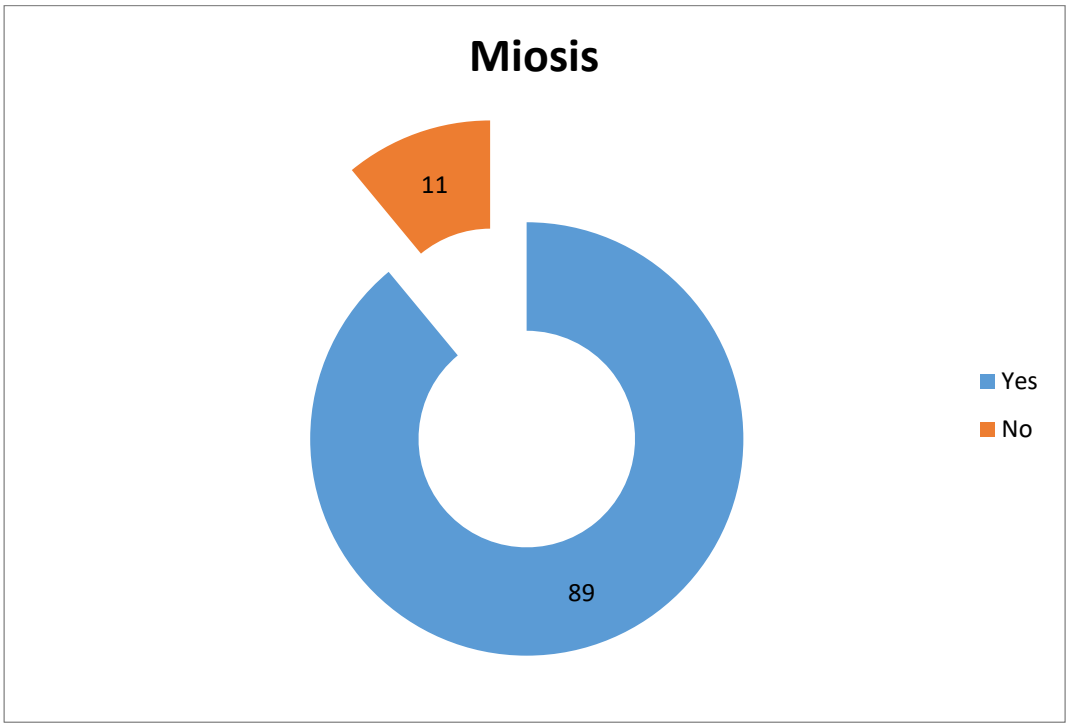
ECG changes	Frequency	Percentage
Bradycardia	**20**	**27**
Incomplete RBBB	**3**	**4**
Normal	**17**	**23**
Sinus Tachycardia	**34**	**46**
Total	**74**	**100**



The results showed that out of 74 cases of organophosphate poisoning, 23% individuals showed normal ECG, while sinus tachycardia was seen among 34 (46%) individuals followed by bradycardia and incomplete RBBB which was seen among 20 (27%) and 3(4%) individuals respectively.

TABLE 12: Distribution of cases as per miosis.

Miosis	Frequency	Percentage
Yes	66	89
No	8	11
Total	74	100



Out of 74 cases of organophosphate poisoning, 66 (89%) cases presented with miosis while 8 (11%) had no miosis.

TABLE 13: Association of variables with Sick euthyroid

Variables		Normal thyroid		Sick Euthyroid		P value
		Frequency	Percentage	Frequency	Percentage	
Age	≤20	6	67	3	33	0.001*
	21-30	15	48	16	52	
	31-40	8	47	9	53	
	41-50	2	33	4	67	
	51-60	2	50	2	50	
	>60	2	29	5	71	
Variables		**Frequency**	**Percentage**	**Frequency**	**Percentage**	**P Value**
Sex	Male	18	39	28	61	0.01
	Female	17	61	11	39	
Compound	Organophosphates	23	49	24	51	0.00*
	Carbamates	3	27	8	73	0.00*
	Pyrethroid	5	63	3	38	
	Organochlorine	4	50	4	50	
Type of exposure	Ingestion	32	46	37	54	0.00*
	Inhalation	3	60	2	40	
Level of Cholinesterase IU/L	<200	10	38	16	62	0.03*
	201-500	7	58	5	42	
	501-1000	3	38	5	63	
	1001-1500	4	36	7	64	
	1501-2000	0	0	3	100	
	2001-2500	6	86	1	14	
	2501-3000	4	67	2	33	
	>3000	1	100	0	0	

Prior treatment	**Yes**	**7**	**70**	**3**	**30**	**0.00***
	No	**28**	**44**	**36**	**56**	
ECG Changes	**Bradycardia**	**7**	**35**	**13**	**65**	**0.00***
	Incomplete RBBB	**0**	**0**	**3**	**100**	
	Normal	**12**	**71**	**5**	**29**	
	Sinus Tachycardia	**16**	**47**	**18**	**53**	
Variables		**Frequency**	**Percentage**	**Frequency**	**Percentage**	**P Value**
Miosis	**Yes**	**29**	**44**	**37**	**56**	**0.00***
	No	**6**	**75**	**2**	**25**	
Hb in g/dl	**<12g/dl**	**12**	**55**	**10**	**45**	0.05
	≥12g/dl	**23**	**44**	**29**	**56**	
AST in IU	**5-40**	**28**	**49**	**29**	**51**	**0.00***
	>40	**7**	**41**	**10**	**59**	
ALT in IU	**<40**	**2**	**4**	**24**	**46**	0.15
	≥40	**22**	**100**	**15**	**68**	
***: P value significant at value less than 0.05**						

Our study revealed that cohort of age group was statistically significant(p=0.00) with sick euthyroid among organophosphate poisoning and males showed significant higher sick euthyroid among organophosphate poisoning with p value of 0.01. Carbamates and organophosphates with ingestion were significantly associated with euthyroid. Low level of serum cholinesterase was significantly co related to euthyroid (0.03). Other factors which were statistically related to sick euthyroid were no prior treatment (0.00), ECG changes of incomplete RBBB with miosis and AST value more than 40IU.

DISCUSSION

The comprehensive analysis is carried out of the patients with organophosphate poisoning admitted in wards or ICU of Department of General Medicine at Dr. Prabhakar Kore Hospital and Medical research Centre, Belagavi.

SOCIO DEMOGRAPHIC PROFILE OF PATIENTS:

DISTRIBUTION OF CASES ACCORDING TO AGE GROUP:

Our study revealed that majority of the cases of organophosphate poisoning were in the age group of 21 to 31 years (42%) with mean age being 34.4±15.9. The World Health organization showed the similar findings of 3 million cases of organophosphate poisoning and 40000 deaths annually among cases below 30 years of age.[31] Similarly studies conducted at Sri Lanka, Kashmir and Mangalore showed the incidence of organophosphorus poisoning among 20 to 30 years of age group.[32,33] The mean age of the cases in our study was 34.4±15.9 which was similar to the study carried out at turkey by Murat and Guven et al showed similar observation of mean age of 30±15 among organophosphate poisoning exposure.[34] The observation reveals that organophosphate poisoning was most commonly seen among 21-31 years age group who form the most productive phase of life and are subjected to various emotional conflicts due to productivity and procurement leading to suicidal tendency. Hence, they require counseling especially in the age group of 20 to 40 years to reduce the incidence of organophosphate poisoning.

DISTRIBUTION OF CASES ACCORDING TO GENDER

Our study revealed that organophosphate poisoning was more among males (62%) as compared to females (38%). These observations were similar to the study

carried out in Manglore and Sri Lanka, where males were more subjected to intoxication (86%) as compared to females.1,2 Similar findings were seen in a study carried out at Tamil Nādu which showed male predominance in organophosphate poisoning.[35] Male predominance in organophosphate intoxication may be associated with handling and exposure in the particular age group. Since males are commonly involved in spraying the organophosphate compounds at the agricultural land.

DISTRIBUTION OF CASES ACCORDING TO COMPOUNDS OF PESTICIDES

Our results showed that organophosphate(64%) compound was the major cause of poisoning and this results are similar to the global incidence of organophosphate poisoning, which accounts to 80% of pesticide related hospitalisation.[36] The national survey carried out to assess the cause of human poisoning among Bangladesh showed that the major cause being organophosphate.[31] This can be attributed to increase in the use of organophosphate insecticide at the agricultural and household use thus leading to increased human poisoning.

DISTRIBUTION OF CASES BASED ON THE INCIDENCE OF SICK EUTHYROID AMONG DIFFERENT ORGANOPHOSPHATE COMPOUNDS.

Our results showed that out of 74 cases the incidence of sick euthyroid was seen among 39 individuals contributing to 53% among which, organophosphate poisoning formed the majority (62%) while 28% individuals had low T3, T4 and TSH level. In the study carried out at Turkey among organophosphate poisoning revealed that 31.8% of individual with organophosphate poisoning had sick euthyroid.[25] The incidence of sick euthyroid was associated more with organophosphate (62%)

compound. In a prospective study carried out to assess the clinical profile of patients with sick euthyroid at Palghar, Maharashtra showed that sick euthyroidism was associated with OPC poisoning only among 25% of the individuals.[37,38] The increased incidence of sick euthyroidism in our study may be associated accessibility to detailed clinical investigation among patients with OPC poisoning at the tertiary care hospital.

DISTRIBUTION OF CASES ACCORDING TO TYPE OF EXPOSURE

Out of 74 cases of organophosphate poisoning, majority of cases 69(93%) had cause being ingestion while 5(7%) had inhalation route of poisoning.

Our study revealed that majority of organophosphate poisoning was due to ingestion (93%) in comparison to inhalation route (7%). The observations are similar to study carried out in Kashmir valley where route of exposure by ingestion was more than 90% as compared to inhalation.[33] Similarly study carried out in turkey showed 93% exposure was due to ingestion.[39]

DISTRIBUTION OF CASES ACCORDING TO SERUM CHOLINESTERASE

Our study revealed that majority of organophosphate poisoning had low cholinesterase level less than 200 which was seen among 35% cases and 201 to 500 was observed among 15% of individuals. The mean cholinesterase seen in our study was 913.2±15.3. The findings are similar to studies carried out by Dreisbach and finding from a study carried out among patients of organophosphate poisoning in Bangalore which showed increase in serum cholinesterase level with the severity of organophosphate poisoning. While the observation from Chugh and Navneet Agarwal showed correlation of low serum cholinesterase with organophosphate poisoning.[40]

DISTRIBUTION OF CASES ACCORDING TO PRIOR TREATMENT

Out of 74 cases the results showed that majority of the cases that is 64(86%) had no history of prior treatment. The results are similar to study carried out by Senanayakke N et al who showed delayed initiation of treatment among organophosphate poisoning. The delay in the treatment may be attributed to isolation and suicidal attempt leading to delayed noticing and treatment.[2 2]

DISTRIBUTION OF CASES ACCORDING TO ECG CHANGES

In our study out of 74 individuals, 34(46%) of them showed sinus tachycardia while bradycardia was seen in 20(27%) of individuals. The observation from a similar study conducted by Karelliedde L showed bradycardia and complete heart block with prolonged QT interval.[41] In a prospective study carried out to assess the impact of organophosphate poisoning on electrocardiographical manifestation showed 62.2% individuals developed cardiac complication while prolonged QT interval was seen in 38% of individuals.[42] Some studies also showed association of polymorphic ventricular tachycardia with prolonged QT interval and organophosphate poisoning.[43, 44] Some observations also showed presence of hypertension and tachycardia as the manifestation of severe poisoning.[45] The cause for ECG changes among organophosphate poisoning patients may be attributed to hypoxemia and delayed electrolyte imbalance.

DISTRIBUTION OF CASES ACCORDING TO MIOSIS:

Our study showed that out of 74 cases 66 individuals presented with miosis. Similar observations were seen in a study to assess the adverse effect of organophosphate poisoning. The results showed organophosphate inhibits

cholinesterase activities leading to acute muscarinic activities including miosis.[46] Blurred vision or miosis is one of the early manifestations of organophosphate poisoning.[47] Miosis is the common clinical manifestation of organophosphate poisoning along with other symptoms like diarrhea, urination, diaphoresis, lacrimation based on pseudo cholinesterase activity. The observations are review which showed literature supporting miosis as a common manifestation due to pupil constriction and blurring of vision among individuals with organophosphate poisoning.[48]

ASSOCIATION OF VARIABLES WITH SICK EUTHYROID

Our study revealed that Age group was statistically significant(p=0.00) with sick euthyroid among organophosphate poisoning and males showed significant higher sick euthyroid among organophosphate poisoning with p value of 0.01. Carbamates and organophosphates with ingestion were significantly associated with euthyroidism and the low level of serum cholinesterase was associated with euthyroid (0.03). Other factors which were statistically associated with sick euthyroid were no prior treatment (0.00), ECG changes of incomplete RBBB with miosis and AST value of more than 40 IU/L.

Our study assessed the effect of various factors on organophosphate poisoning. The factors which were significantly associated with sick euthyroidism were increased age group and male gender. The sick euthyroid was significantly associated with carbamate compound mainly by ingestion route. The sick euthyroid was also significantly associated with decreased cholinesterase level with no prior treatment. The clinical manifestations significantly associated with euthyroid were incomplete RBBB and miosis. The various adverse effect of organophosphate poisoning are attributed to human beings which are categorized into acute, chronic

toxicity, neuropathic, reproductive, immunotoxicity carcinogenic effect etc.[49] The results of our study were similar to observations done by Eun Jung et al showed significant level of physiological derangement associated with organophosphate poisoning.[50] The observation were similar to study carried out in turkey which showed mild elevation of liver function test with the development of mild acidosis.[41,51]

CONCLUSION

- Pesticide poisoning is more common among young adult males in the age group of 20 to 40 years with the motive of suicidal tendency.
- The poisoning is more common through ingestion of pesticide which is easily accessible specially among farmers.
- The incidence of euthyroidism among organophosphate poisoning is quite high.
- The biochemical investigations in our study shows an elevation in organophosphate poisoning. This can be used as an indicator to assess the severity of poisoning.
- The serum cholinesterase and thyroid investigation can also be used as prognostic markers in assessment of severity of organophosphate poisoning.
- Hence, we conclude that biochemical markers and thyroid investigations helps in early diagnosis and prompt treatment of organophosphate poisoning.

SUMMARY

Organophosphate poisoning is the one of the major cause of self harm and mortality in India. Majority of them are the suicidal tendencies commonly seen among young male with the occupation of farming and daily wage laborers. The present study was carried out among individuals admitted in wards and ICU of Dr. Prabhakar Kore Hospital, Belagavi. Patients with the known history of organophosphate poisoning were included in the study. Baseline laboratory investigation and thin layer chromatography of gastric aspirate was done. The cholinesterase was assessed by kinetic colorimetric method. Our results showed that out of 74 cases studied majority were males belonging to the age group of 21-40 years. The major compound of poisoning was monochrotophos organophosphate compound by ingestion route. Sick euthyroid was observed in majority of the cases with low T3 level. No prior history of treatment was seen in 64 individuals. While, 10 individuals presented with the prior history of treatment. ECG changes in terms of sinus tachycardia, RBBB were seen in these cases. The miosis and blurring of vision was observed in 66 individuals. The factors which were statistically associated with sick euthyroidism were males in higher age group, low serum cholinesterase, incomplete RBBB and elevated AST level.

RECOMMENDATIONS

- Proper guidelines to avoid irrational use of organophosphate poisoning.
- Strict regulation regarding packaging and distribution of organophosphate poisoning.
- Health hazards and educating the persons handling the pesticides.
- Counseling and support to the risk population.
- Thyroid hormone estimation is to be considered as important prognostic marker to assess the prognosis, morbidity and mortality in cases of poisoning by organophosphorus compound.
- Follow up with the thyroid profile during recovery to monitor for hypothyroidism

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ANNEXURE I. ETHICAL CLEARANCE.

K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed - to - be - University)
Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category 'A' by MHRD (GoI)
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Ref: MDC/DOME/197 Date: 24/12/2019

To.

REG. NO: BG0119004

PG student in Medicine,
J.N.Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"STUDY OF SICK EUTHYROID SYNDROME IN ORGANOPHOSPHATE POISONING –A HOSPITAL BASED ONE YEAR CROSS SECTIONAL STUDY IN KLES' DR PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Anita Dalal)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

11

ANNEXURE II

INFORMED CONSENT

" STUDY OF SICK EUTHYROID SYNDROME IN ORGANOPHOSPHATE POISONING- A HOSPITAL BASED ONE YEAR CROSS SECTIONAL STUDY IN KLES' DR PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE BELAGAVI"

Principal Investigator:-

REG. NO: BG0119004
Post Graduate Student,
Department Of General Medicine,
JNMC, Belagavi.

Guide:-

Dr. _____
MD General Medicine
Associate Professor
Department of General Medicine,
JNMC, Belagavi.

Introduction and Purpose:- Pesticides are commonly used compounds in agriculture. Especially, organophosphates (OPs) are among the extensively used pesticides. Therefore, OPs poisoning is common, especially in underdeveloped and developing countries.

Abnormal thyroid hormone levels have been described in the presence of heart failure, chronic renal failure, liver disease, stress, starvation, surgery, trauma, infections, and autoimmune diseases, as well as with the use of number of drugs. However, thyroid functions returns to normal when the nonthyroidal illness is resolved. In this present study we aimed to investigate the effects of organophosphate

poisoning on thyroid hormones which have the most important role in the determination of basal metabolic rate, maintaining the metabolic homeostasis.It can help in providing a proper care to the patients who developed sick euthyroid syndrome during the illness as they are at risk of developing hypothyroidism in future.

Hence this study is being considered to fill the gaps in knowledge about incidence of sick euthyroid syndrome in organophosphate poisoning.

Procedure:

If you agree to be part of the research study, you will be asked the relevant history and will be subjected to relevant clinical examination and investigations. You will also have to give blood and urine samples for the necessary investigations.

Risk and Benefits:

The only risk and possible discomfort you might get is while taking blood from your arm for the investigations. It may cause swelling, pain, redness (rarely happens) at the site from where the blood is drawn.

You may not be benefitted by these investigations but you will be part of this study which is going to be useful to others in the future.

Alternatives:

Taking part in this study is voluntary. You may choose not to take part in this study.

If you decide to take part you can later change your mind and withdraw from the study. Your decision will not change the present or future health care or other services that you receive. The study doctor or sponsor may stop your participation in this study at any time. If you choose not to take part in the study, you will receive the standard treatment for patients with your condition.

Privacy and Confidentiality:

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. The code numbers will identify you in this research record. Information from this study may be published but your identity will be confidential in any publication.

Institution / Sponsor's policy:

Does not apply to this research

Financial incentives for participation:

You will not be paid / offered any gifts /incentives for participating in the study.

Authorization to publish the results:

The results of the study would be forwarded to the KLE University, Belagavi as part of requirement towards the completion of MD degree, review and publishing.

In case of the queries during study or in future you may contact following persons,

1. Dr. Roopa Bellad, Chairman, J.N.M.C Ethical Committee for Human Research 9480275601	2. Dr. _____ Associate Professor, Dept of General Medicine, JNMC, Belagavi.

3. **REG. NO: BG0119004**
Investigator,
PG in General Medicine,
JNMC, Belagavi.

CONSENT FORM

Title Of Research Study: STUDY OF SICK EUTHYROID SYNDROME IN ORGANOPHOSPHATE POISONING- A HOSPITAL BASED ONE YEAR CROSS SECTIONAL STUDY IN KLES' DR PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE BELAGAVI.

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has been read to me and has been explained to me in my vernacular language and all my questions have been answered. I will be given a copy of this consent form.

Signature / Left Thumb print of the Participant or legally authorized representative

Participant's name :……...

Signature / Left thumb impression :……...

of the participant

Name of the legally authorized :……...

representative / guardian

Signature / Left thumb impression :……...

Witness' name :……...

Signature / Left thumb impression :……...

Investigator's name and signature :……...

Date:

Place:

ತಿಳುವಳಿಕೆಯ ಸಮ್ಮತಿ

ಸಂಶೋಧನಾ ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ: "ಆರ್ಗನೋಫಾಸ್ಫೇಟೊಯಿಸನಿಂಗ್ನಲ್ಲಿ ಅನಾರೋಗ್ಯದ ಯುಥೈರಾಯ್ಡ್ ಸಿಂಡ್ರೋಮ್ನ ಅಧ್ಯಯನ- ಕ್ಲೆಸ್'ಆರ್ ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದ ಬೆಳಗಾವಿಯಲ್ಲಿ ಆಸ್ಪತ್ರೆ ಆಧಾರಿತ ಒಂದು ವರ್ಷದ ಅಡ್ಡ ವಿಭಾಗೀಯ ಅಧ್ಯಯನ"

ಪ್ರಧಾನ ತನಿಖಾಧಿಕಾರಿ: -

REG. NO: BG0119004

ಸ್ನಾತಕೊತ್ತರ ವಿದ್ಯಾರ್ಥಿ,
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜೆಎನ್ಎಂಸಿ, ಬೆಳಗಾವಿ.

ಮಾರ್ಗದರ್ಶಿ: -
ಡಾ. _____
ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕ
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜೆಎನ್ಎಂಸಿ, ಬೆಳಗಾವಿ.

ಪರಿಚಯ ಮತ್ತು ಉದ್ದೇಶ: -
ಕೀಟನಾಶಕಗಳನ್ನು ಸಾಮಾನ್ಯವಾಗಿ ಕೃಷಿಯಲ್ಲಿ ಬಳಸುವ ಸಂಯುಕ್ತಗಳು. ವಿಶೇಷವಾಗಿ, ಆರ್ಗನೋಫಾಸ್ಫೇಟ್ಸ್ಗಳು (ಒಪಿಗಳು) ವ್ಯಾಪಕವಾಗಿ ಬಳಸುವ ಕೀಟನಾಶಕಗಳಲ್ಲಿ ಸೇರಿವೆ. ಆದ್ದರಿಂದ, ಒಪಿಗಳ ವಿಷವು ಸಾಮಾನ್ಯವಾಗಿದೆ, ವಿಶೇಷವಾಗಿ ಅಭಿವೃದ್ಧಿಯಾಗದ ಮತ್ತು ಅಭಿವೃದ್ಧಿ ಹೊಂದುತ್ತಿರುವ ದೇಶಗಳಲ್ಲಿ.
ಅಸಹಜ ಥೈರಾಯ್ಡ್ ಹಾರ್ಮೋನ್ ಮಟ್ಟವನ್ನು ಹೃದಯ ವೈಫಲ್ಯ, ದೀರ್ಘಕಾಲದ ಮೂತ್ರಪಿಂಡ ವೈಫಲ್ಯ, ಪಿತ್ತಜನಕಾಂಗದ ಕಾಯಿಲೆ, ಒತ್ತಡ, ಹಸಿವು, ಶಸ್ತ್ರಚಿಕಿತ್ಸೆ, ಆಘಾತ, ಸೋಂಕುಗಳು ಮತ್ತು ಸ್ವಯಂ ನಿರೋಧಕ ಕಾಯಿಲೆಗಳ ಉಪಸ್ಥಿತಿಯಲ್ಲಿ ವಿವರಿಸಲಾಗಿದೆ, ಜೊತೆಗೆ .ಷಧಿಗಳ ಸಂಖ್ಯೆಯ ಬಳಕೆಯೊಂದಿಗೆ ವಿವರಿಸಲಾಗಿದೆ. ಆದಾಗ್ಯೂ, ನಾನ್ಥೈರಾಯ್ಡಲ್ ಅನಾರೋಗ್ಯವನ್ನು ಪರಿಹರಿಸಿದಾಗ ಥೈರಾಯ್ಡ್ ಕಾರ್ಯಗಳು ಸಾಮಾನ್ಯ ಸ್ಥಿತಿಗೆ ಮರಳುತ್ತವೆ. ಈ ಪ್ರಸ್ತುತ ಅಧ್ಯಯನದಲ್ಲಿ ನಾವು ಥೈರಾಯ್ಡ್ ಹಾರ್ಮೋನುಗಳ ಮೇಲೆ ಆರ್ಗನೋಫಾಸ್ಫೇಟ್ ವಿಷದ ಪರಿಣಾಮಗಳನ್ನು ತನಿಖೆ ಮಾಡುವ ಗುರಿಯನ್ನು ಹೊಂದಿದ್ದೇವೆ, ಇದು ತಳದ ಚಯಾಪಚಯ ದರವನ್ನು ನಿರ್ಧರಿಸುವಲ್ಲಿ ಪ್ರಮುಖ ಪಾತ್ರ ವಹಿಸುತ್ತದೆ, ಚಯಾಪಚಯ ಹೋಮಿಯೋಸ್ಟಾಸಿಸ್ ಅನ್ನು ಕಾಪಾಡಿಕೊಳ್ಳುತ್ತದೆ. ಅನಾರೋಗ್ಯದ ಯುಥೈರಾಯ್ಡ್ ಅನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸಿದ ರೋಗಿಗಳಿಗೆ ಸರಿಯಾದ ಆರೈಕೆಯನ್ನು ಒದಗಿಸಲು ಇದು ಸಹಾಯ ಮಾಡುತ್ತದೆ. ಭವಿಷ್ಯದಲ್ಲಿ ಹೈಪೋಥೈರಾಯ್ಡಿಸಮ್ ಬೆಳವಣಿಗೆಯಾಗುವ ಅಪಾಯವಿರುವುದರಿಂದ ಅನಾರೋಗ್ಯದ ಸಮಯದಲ್ಲಿ ಸಿಂಡ್ರೋಮ್.

ಆದ್ದರಿಂದ ಆರ್ಗನೋಫಾಸ್ಫೇಟ್ ವಿಷದಲ್ಲಿ ಅನಾರೋಗ್ಯದ ಯುಥೈರಾಯ್ಡ್ ಸಿಂಡ್ರೋಮ್ನ ಸಂಭವದ ಬಗ್ಗೆ ಜ್ಞಾನದ ಅಂತರವನ್ನು ತುಂಬಲು ಈ ಅಧ್ಯಯನವನ್ನು ಪರಿಗಣಿಸಲಾಗುತ್ತಿದೆ.

ವಿಧಾನ:
ಸಂಶೋಧನಾ ಅಧ್ಯಯನದ ಭಾಗವಾಗಲು ನೀವು ಒಪ್ಪಿದರೆ, ನಿಮಗೆ ಸಂಬಂಧಿತ ಇತಿಹಾಸವನ್ನು ಕೇಳಲಾಗುತ್ತದೆ ಮತ್ತು ಸಂಬಂಧಿತ ಕ್ಲಿನಿಕಲ್ ಪರೀಕ್ಷೆ, ಮತ್ತು ತನಿಖೆಗೆ ಒಳಪಡಿಸಲಾಗುತ್ತದೆ. ಅಗತ್ಯ ತನಿಖೆಗಾಗಿ ನೀವು ರಕ್ತ ಮತ್ತು ಮೂತ್ರದ ಮಾದರಿಗಳನ್ನು ಸಹ ನೀಡಬೇಕಾಗುತ್ತದೆ.

ಅಪಾಯ ಮತ್ತು ಪ್ರಯೋಜನಗಳು:
ತನಿಖೆಗಾಗಿ ನಿಮ್ಮ ತೋಳಿನಿಂದ ರಕ್ತವನ್ನು ತೆಗೆದುಕೊಳ್ಳುವಾಗ ನೀವು ಪಡೆಯುವ ಏಕೈಕ ಅಪಾಯ ಮತ್ತು ಸಂಭವನೀಯ ಅಸ್ವಸ್ಥತೆ. ಇದು ರಕ್ತವನ್ನು ಎಳೆಯುವ ಸ್ಥಳದಲ್ಲಿ ಬೆವರುವಿಕೆ, ನೋವು, ಕೆಂಪು (ವಿರಳವಾಗಿ ಸಂಭವಿಸುತ್ತದೆ) ಗೆ ಕಾರಣವಾಗಬಹುದು.
ಈ ತನಿಖೆಯಿಂದ ನಿಮಗೆ ಯಾವುದೇ ಪ್ರಯೋಜನವಾಗದಿರಬಹುದು ಆದರೆ ಭವಿಷ್ಯದಲ್ಲಿ ಇತರರಿಗೆ ಉಪಯುಕ್ತವಾಗಲಿರುವ ಈ ಅಧ್ಯಯನದ ಭಾಗವಾಗುತ್ತೀರಿ.

ಪರ್ಯಾಯಗಳು:
ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವುದು ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸದಿರಲು ನೀವು ಆಯ್ಕೆ ಮಾಡಬಹುದು.
ನೀವು ಭಾಗವಹಿಸಲು ನಿರ್ಧರಿಸಿದರೆ ನೀವು ನಂತರ ನಿಮ್ಮ ಮನಸ್ಸನ್ನು ಬದಲಾಯಿಸಬಹುದು ಮತ್ತು ಅಧ್ಯಯನದಿಂದ ಹಿಂದೆ ಸರಿಯಬಹುದು. ನಿಮ್ಮ ನಿರ್ಧಾರವು ಪ್ರಸ್ತುತ ಅಥವಾ ಭವಿಷ್ಯದ ಆರೋಗ್ಯ ರಕ್ಷಣೆ ಅಥವಾ ನೀವು ಸ್ವೀಕರಿಸುವ ಇತರ ಸೇವೆಗಳನ್ನು ಬದಲಾಯಿಸುವುದಿಲ್ಲ. ಅಧ್ಯಯನ ವೈದ್ಯರು ಅಥವಾ ಪ್ರಾಯೋಜಕರು ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆಯನ್ನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ನಿಲ್ಲಿಸಬಹುದು. ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸದಿರಲು ನೀವು ಆರಿಸಿದರೆ, ನಿಮ್ಮ ಸ್ಥಿತಿಯ ರೋಗಿಗಳಿಗೆ ನೀವು ಪ್ರಮಾಣಿತ ಚಿಕಿತ್ಸೆಯನ್ನು ಸ್ವೀಕರಿಸುತ್ತೀರಿ.

ಗೌಪ್ಯತೆ ಮತ್ತು ಗೌಪ್ಯತೆ:
ಈ ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ನಿಮ್ಮ ಬಗ್ಗೆ ಸಂಗ್ರಹಿಸಲಾದ ಎಲ್ಲಾ ಮಾಹಿತಿಯನ್ನು ಕಾನೂನಿನಿಂದ ಅನುಮತಿಸುವ ಮಟ್ಟಿಗೆ ಗೌಪ್ಯವಾಗಿಡಲಾಗುತ್ತದೆ. ಈ ಸಂಶೋಧನಾ ದಾಖಲೆಯಲ್ಲಿ ಕೋಡ್ ಸಂಖ್ಯೆಗಳು ನಿಮ್ಮನ್ನು ಗುರುತಿಸುತ್ತವೆ. ಈ ಅಧ್ಯಯನದ ಮಾಹಿತಿಯನ್ನು ಪ್ರಕಟಿಸಬಹುದು ಆದರೆ ಯಾವುದೇ ಪ್ರಕಟಣೆಯಲ್ಲಿ ನಿಮ್ಮ ಗುರುತು ಗೌಪ್ಯವಾಗಿರುತ್ತದೆ.

ಸಂಸ್ಥೆ / ಪ್ರಾಯೋಜಕರ ನೀತಿ: ಈ ಸಂಶೋಧನೆಗೆ ಅನ್ವಯಿಸುವುದಿಲ್ಲ

ಭಾಗವಹಿಸುವಿಕೆಗೆ ಆರ್ಥಿಕ ಪ್ರೋತ್ಸಾಹ:
ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಿಮಗೆ ಯಾವುದೇ ಉಡುಗೊರೆಗಳನ್ನು / ಪ್ರೋತ್ಸಾಹಕಗಳನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ / ನೀಡಲಾಗುವುದಿಲ್ಲ.

ಫಲಿತಾಂಶಗಳನ್ನು ಪ್ರಕಟಿಸಲು ಅಧಿಕಾರ:
ಅಧ್ಯಯನದ ಫಲಿತಾಂಶಗಳನ್ನು ಭಾಗವಾಗಿ ಬೆಳಗಾವಿಯ ಕೆಎಲ್ಇ
ವಿಶ್ವವಿದ್ಯಾಲಯಕ್ಕೆ ರವಾನಿಸಲಾಗುತ್ತದೆ
ಎಂಡಿ ಪದವಿ, ವಿಮರ್ಶೆ ಮತ್ತು ಪ್ರಕಟಣೆಯ ಪೂರ್ಣಗೊಳಿಸುವಿಕೆಯ
ಅವಶ್ಯಕತೆ.

ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ಅಥವಾ ಭವಿಷ್ಯದಲ್ಲಿ ನೀವು ಈ ಕೆಳಗಿನ ವ್ಯಕ್ತಿಗಳನ್ನು
ಸಂಪರ್ಕಿಸಬಹುದು,

ಡಾ.ರೂಪಾ ಎಂ ಬೆಲ್ಲಾದ, ಎಂಡಿ

ಅಧ್ಯಕ್ಷ, ಕಾಲೇಜು ನೈತಿಕ ಪ್ರಬಂಧ

ಸಂಶೋಧನಾ ಸಮಿತಿ ಜೆ.ಎನ್. ವೈದ್ಯಕೀಯ. ಕಾಲೇಜು

ನೆಹರೂ ನಗರ, ಬೆಳಗಾವಿ - 9480275601

ಡಾ. _____
ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕ
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜೆಎನ್ಎಂಸಿ, ಬೆಳಗಾವಿ. 9590473440

REG. NO: BG0119004

ತನಿಖಾಧಿಕಾರಿ,
ಸ್ನಾತಕೊತ್ತರ ವಿದ್ಯಾರ್ಥಿ,
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜೆಎನ್ಎಂಸಿ, ಬೆಳಗಾವಿ. 9986044116

ಒಪ್ಪಿಗೆ ಪತ್ರ

ಸಂಶೋಧನಾ ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ: "ಆರ್ಗನೋಫಾಸ್ಫೇಟೊಯಿಸನಿಂಗ್ನಲ್ಲಿ ಅನಾರೋಗ್ಯದ ಯುಥ್ಫೈರಾಯ್ಡ್ ಸಿಂಡ್ರೋಮ್ನ ಅಧ್ಯಯನ- ಕ್ಲೆಸ್'ಆರ್ ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದ ಬೆಳಗಾವಿಯಲ್ಲಿ ಆಸ್ಪತ್ರೆ ಆಧಾರಿತ ಒಂದು ವರ್ಷದ ಅಡ್ಡ ವಿಭಾಗೀಯ ಅಧ್ಯಯನ"

ಕೆಳಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಾನು ಸ್ವಯಂಪ್ರೇರಣೆಯಿಂದ ಒಪ್ಪುತ್ತೇನೆ. ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಹಿಂತೆಗೆದುಕೊಳ್ಳಬಹುದು. ಈ ಫಾರ್ಮ್ಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ ನಾನು ನನ್ನ ಯಾವುದೇ ಕಾನೂನು ಹಕ್ಕುಗಳನ್ನು ಬಿಟ್ಟುಕೊಡುತ್ತಿಲ್ಲ. ಕೆಳಗಿನ ನನ್ನ ಸಹಿ ನಾನು ಈ ಒಪ್ಪಿಗೆಯ ಫಾರ್ಮ್ ಅನ್ನು ಓದಿದ್ದೇನೆ ಅಥವಾ ಈ ಸಮ್ಮತಿಯ ಫಾರ್ಮ್ ಅನ್ನು ನನಗೆ ಓದಿದ್ದೇನೆ ಮತ್ತು ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿದೆ ಎಂದು ಸೂಚಿಸುತ್ತದೆ

ಭಾಗವಹಿಸುವವರ ಅಥವಾ ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕೃತ ಪ್ರತಿನಿಧಿಯ ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಮುದ್ರಣ
ಭಾಗವಹಿಸುವವರ ಹೆಸರು: .....

ಭಾಗವಹಿಸುವವರ ಹೆಸರು: ....

ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....
ಭಾಗವಹಿಸುವವರ

ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕಾರ ಪಡೆದವರ ಹೆಸರು: ....
ಪ್ರತಿನಿಧಿ / ರಕ್ಷಕ

ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....

ಸಾಕ್ಷಿ ಹೆಸರು: ....

ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....

ತನಿಖಾಧಿಕಾರಿ ಹೆಸರು ಮತ್ತು ಸಹಿ: ....

ದಿನಾಂಕ:

ಸ್ಥಳ

माहितीपूर्ण संमती

संशोधन अभ्यासाचा शीर्षकः "ऑर्गोनोफॉस्फरस पोइनिझिंग मध्य आजारी इथिओरॉइड सिंड्रोमचा अभ्यास- क्लिनिडिडर प्रभाकर कोरे हॉस्पिटल अँड मेडिकल रिसर्च सेंटर बागावी यथील एक हॉस्पिटल आधारित एक वर्षाचा क्रॉस सेक्शनल स्टडी"

प्रधान अन्वेषक: -
REG. NO: BG0119004

पदव्युत्तर विद्यार्थी,
सामान्य औषध विभाग,
जेएनएमसी, बेळगावी.

मार्गदर्शन:-

डॉ. _____

सहयोगी प्राध्यापक
सामान्य औषध विभाग,
जेएनएमसी, बेळगावी.

परिचय आणि उद्देश: –
कीटकनाशके सामान्यत: शेतीत संयुगे वापरली जातात. विशेषतः, मोठ्या प्रमाणात वापरल्या जाणाऱ्या कीटकनाशकांपैकी ऑर्गनोफॉस्फरस (ओपीएस). म्हणून ओपी विषबाधा सामान्यत: विकसीत आणि विकसनशील देशांमध्ये आहे.
हृदय अपयश, तीव्र मुत्र अपयश, यकृत रोग, तणाव, उपासमार, शस्त्रक्रिया, आघात, संक्रमण आणि स्वयंप्रतिकार रोग, तसेच औषधांच्या संख्येच्या उपस्थितीत असामान्य थायरॉईड संप्रेरक पातळीचे वर्णन केले गेले आहे. तथापि, नॉनथायरॉइडल आजाराचे निराकरण झाल्यावर थायरॉईड फंक्शन्स सामान्य होतात. या सध्याच्या अभ्यासामध्ये आम्ही थायलॉईड हार्मोन्सवर ऑर्गनोफॉस्फरस विषबाधाच्या परिणामाची तपासणी करण्याचे उद्दीष्ट ठेवले आहे. ज्यात बेसल चयापचय दर निर्धारणामध्ये सर्वात महत्वाची भूमिका आहे. चयापचय होमिओस्टॅसिस टिकवून ठेवणे हे आजारी इथिओरॉइड विकसित झालेल्या रूग्णांना योग्य काळजी प्रदान करण्यात मदत करू शकते. आजारात सिंड्रोम असल्याने भविष्यात त्यांना हायपोथायरॉईडीझम होण्याचा धोका असतो.
म्हणूनच हा अभ्यास ऑर्गनोफॉस्फरस विषबाधा मध्ये आजारी इथिओरॉइड सिंड्रोमच्या घटनांविषयी ज्ञानामधील अंतर भरण्यासाठी विचारात घेत आहे.

प्रक्रियाः
आपण संशोधन अभ्यासाचा भाग होण्यास सहमत असल्यास, आपणास संबंधित इतिहास विचारला जाईल आणि संबंधित क्लिनिकल परीक्षा आणि तपासणीस पात्र करण्यात जाईल. आवश्यक तपासणीसाठी आपल्याला रक्त आणि लघवीचा नमुना द्यावा लागतील.

जोखीम आणि फायदा:
तपासणीसाठी आपल्या बाहेरून रक्त घेत असताना आपल्याला फक्त धोका आणि संभाव्य असुविधाची समस्या उद्भवू शकत ज्या स्थानावरून रक्त ओढल आहे त्या साइटवर स्फुल्लिंग, वेदना, लालसरपणा (क्वचितच घडत) होऊ शकत
या तपासणीमुळे आपल्याला फायदा होणार नाही परंतु आपण या अभ्यासाचा भाग व्हाल ज भविष्यात इतरांना उपयुक्त ठरेल.

विकल्पः
या अभ्यासामध्ये भाग घेणे ऐच्छिक आह आपण या अभ्यासामध्ये भाग न घेणे निवडू शकता. आपण भाग घेण्याचा निर्णय घेतल्यास आपण नंतर आपल मत बदलू आणि अभ्यासापासून दूर जाऊ शकता. आपल्या निर्णयामुळे आपल्याला प्राप्त झालेल्या वर्तमान किंवा भविष्यातील आरोग्य सेवा किंवा इतर सेवा बदलणार नाहीत. अभ्यास डॉक्टर किंवा प्रायोजक या अभ्यासात आपला सहभाग कधीही थांबवू शकतात. आपण अभ्यासामध्ये भाग न घेणे निवडल्यास, आपल्या अट असलेल्या रूग्णांसाठी तुम्हाला प्रमाणित उपचार मिळेल.

गोपनीयता आणि गोपनीयता:
या अभ्यासाच्या दरम्यान आपल्याबद्दल संकलित करण्यात आलेली सर्व माहिती कायद्याद्वारे परवानगी असलेल्या मर्यादेपर्यंत गोपनीय ठेवली जाईल. कोड नंबर आपल्याला या संशोधन रेकॉर्डमध्ये ओळखतील. या अभ्यासाची माहिती प्रकाशित करण्यात जाऊ शकते परंतु आपली ओळख कोणत्याही प्रकाशनात गोपनीय असेल.

संस्था / प्रायोजक यांचे प्रोरणः
या संशोधनास लागू होत नाही

सहभागासाठी आर्थिक प्रोत्साहनः
अभ्यासामध्ये भाग घेण्यासाठी आपल्याला कोणत्याही भेटवस्तू / प्रोत्साहन दिले जाणार नाहीत.

परिणाम प्रकाशित करण्यासाठी अधिकृतताः
अभ्यासाचा निकाल भाग म्हणून करण्यात एलई विद्यापीठ, बेळगाव यांचेकडे पाठविला जाईल एमडी पदवी, पुनरावलोकन आणि प्रकाशन पूर्ण करण्यासाठी आवश्यक

अभ्यासाच्या वक्ती किंवा भविष्यातील प्रश्नांच्या बाबतीत आपण खालील व्यक्तींशी संपर्क साधू शकता,

प्रधान अन्वेषक: -
REG. NO: BG0119004

पदव्युत्तर विद्यार्थी,
सामान्य औषध विभाग,
जेएनएमसी, बेळगावी.

मार्गदर्शन:-

डॉ. _____

सहयोगी प्राध्यापक
सामान्य औषध विभाग,
जेएनएमसी, बेळगावी.

डॉ. रूपा एम बेल्लाड एमडी
अध्यक्ष, महाविद्यालयीन नैतिक प्रबंध
संशोधन समिती जेएन एन मेडिकल. कॉलेज
नेहरू नगर, बेळगावी – 590010

संमती फॉर्म

मी खाली स्वाक्षरी करून या अभ्यासात भाग घेण्यास स्वेच्छेने सहमत आहे. मी कधीही माघार घेऊ शकतो. या फॉर्मवर सही करून मी माझा कोणताही कायदेशीर हक्क सोडत नाही. खाली माझी स्वाक्षरी सूचित करते की मी हा संमती फॉर्म वाचला आहे किंवा हा संमती फॉर्म मला वाचला आहे आणि मला सर्व प्रश्नांची उत्तरे दिली आहेत.

सहभागी किंवा कायदेशीररित्या अधिकृत प्रतिनिधीची सही / डावा अंगठा प्रिंट

सहभागीचे नाव: ....

स्वाक्षरी / डावा अंगठा ठसा: ....
सहभागीचा

कायदेशीररीत्या अधिकृत नाव: ....
प्रतिनिधी / पालक

स्वाक्षरी / डावा अंगठा ठसा: ....

साक्षीचे नाव: ....

स्वाक्षरी / डावा अंगठा ठसा: ....

अन्वेषकांचे नाव आणि स्वाक्षरी: ....

तारीख:

ठिकाण:

ANNEXURE III

PROFORMA

CASE NO:

NAME: DATE:

AGE/SEX:

IP NO.:

ADDRESS:

OCCUPATION:

ADDRESS:

PHONE NO:

DOA:

BRIEF HISTORY

AMOUNT INGESTED

DATE OF INGESTION

TIME OF INGESTION

TIME SINCE CONSUMPTION

SYMPTOMS ON PRESENTATION IN DETAIL:

PRIOR TREATMENT:

PROVIDER:

SUPPORTIVE:

ANTIDOTE:

TIME TAKEN TO REACH FIRST TREATMENT CENTRE:

PERSONAL HISTORY :

PREVIOUS HISTORY OF POISONING [YES / NO] IF YES _DETAILS:

PHYSICAL EXAMINATION

GENERAL EXAMINATION

VITAL SIGNS

PULSE

RATE

RHYTHM

BP

SYMPTOMATOLOGY

Nausea, Vomiting in case of ingestion

Cough, burning sensation in the chest in case of inhalation

Mild systemic symptoms like headache, dizziness, weakness

Abdominal Pain, diarrhea in case of ingestion

Tightness in chest, difficulty in breathing in case of inhalation

Salivation, Lacrimation, Sweating,

Pupillary Changes

Bradycardia,

Confusion, Tremor, Restlessness.

Respiratory depression, generalized weakness

Cyanosis, peripheral circulatory failure,

Convulsions, Coma.

RESPIRATORY RATE

TEMPERATURE

CARDIOVASCULAR SYSTEM

RESPIRATORY SYSTEM

GASTROINTESTINAL SYSTEM

CENTRAL NERVOUS SYSTEM

GCS

INVESTIGATIONS

CBC

RFT

BLOOD SUGAR

UREA

SERUM CREATININE

NA+

K+

LFT

TOTAL BILIRUBIN

AST

ALT

TOTAL PROTEIN

SERUM CHOLINESTERASE LEVEL

THYROID PROFILE

T3

T4

TSH

ECG

IP NO	AGE	SEX	HB	WBC	PLATELET	GLUCOSE	UREA	CREATININE	SODIUM	POTASSIUM	T.BILIRUBIN	AST	ALT	T.PROTEIN	SR.ACHe	T3	T4	TSH	ECG	MIOSIS	PRIOR TREATMENT	INGESTION	INHALATION
992908	22	M	16.4	18.3	3.23	153	35	1.44	139	7.38	0.5	35	45	9.4	768	0.3	7	0.4	SINUS TACHYCARDIA	YES	NO	YES	
992274	37	M	14.3	8.3	2.63	99	30	0.7	142	3.59	0.78	29	47	6.3	64	0.2	4.4	4.7	SINUS TACHYCARDIA	YES	NO	YES	
997328	45	F	12.4	14.4	2.12	103	100	4.4	140	5.41	0.6	292	64	5	287	0.2	4.5	4.7	SINUS TACHYCARDIA	YES	NO	YES	
990040	32	M	12	7.8	1.94	142	29	0.79	141	4.05	0.62	49	69	7.6	189	0.9	7.1	0.4	SINUS TACHYCARDIA	YES	NO	YES	
988324	24	F	11.2	12.6	5.41	230	25	1.01	142	4.2	0.45	120	48	6.7	211	0.8	6.7	7.13	SINUS TACHYCARDIA	YES	NO	YES	
992615	34	F	11.8	10.4	5.61	121	10	0.32	134	5	0.6	14	30	5.6	2527	0.48	6.7	5	NORMAL	YES	NO	YES	
1017180	37	F	14.2	9	4.3	103	14	0.48	139	4.88	0.6	30	46	6.1	332	0.7	9.2	0.98	SINUS TACHYCARDIA	YES	NO	YES	
1017574	28	M	17.7	13.3	4.15	209	17	1.09	144	3.68	0.78	43	38	9	143	1.6	14.1	0.92	BRADYCARDIA	YES	NO	YES	
1017579	22	F	9	9.8	1.63	124	10	0.91	141	4.19	0.7	10	17	7.8	2370	1.6	11.2	0.83	NORMAL	NO	YES	YES	
1019669	28	M	14.4	11.3	2.04	96	20	0.86	144	4.12	0.15	32	45	4.8	2247	1	6.8	1.46	NORMAL	NO	YES	NO	YES
1020180	37	M	11.8	11.8	2.67	156	19	1.26	151	3.83	0.68	21	31	7.3	81	1	7.2	0.18	SINUS TACHYCARDIA	NO	YES	YES	
1026720	19	M	14.9	5.6	2.75	108	14	0.82	139	4.5	0.45	14	18	6.5	1054	0.5	4.8	1.47	NORMAL	YES	NO	YES	
1027865	36	F	11.2	14.6	4.73	118	28	1.4	141	3.8	0.3	14	18	7.8	800	2.1	6.1	13.7	SINUS TACHYCARDIA	NO	YES	YES	
1029532	79	F	10.5	18.1	3.29	196	76	0.65	127	3.9	0.04	10	30	5.6	350	0.3	4.9	4.05	SINUS TACHYCARDIA	NO	YES	YES	
1030103	22	M	13.8	6.5	1.82	108	117	3.86	139	3.41	0.84	28	17	4.2	2569	0.5	4.3	1.38	BRADYCARDIA	YES	NO	YES	
1031045	23	F	8.5	16	5	140	23	0.52	132	4.72	0.27	12	11	7.4	1045	0.5	5.7	2.29	SINUS TACHYCARDIA	YES	YES	YES	
1031820	22	M	15.1	12.5	3.22	82	14	0.82	142	3.81	0.58	20	32	7.8	1569	0.7	5.1	1.45	NORMAL	YES	NO	YES	
1035110	19	F	11.8	3.5	2.61	70	72	5.61	141	4.51	1.9	194	155	4.6	3058	1.1	9.1	2.7	SINUS TACHYCARDIA	YES	NO	YES	
1036905	40	M	13	16.5	2.2	117	26	1.09	147	3.93	0.9	24	22	8.4	90	0.5	5	0.36	SINUS TACHYCARDIA	YES	NO	YES	
1036851	28	F	11.5	13	2.22	108	28	0.83	139	4	0.57	94	122	6.9	1478	FREE 1.66	FREE 1.09	1.87 FREE	BRADYCARDIA	YES	NO	YES	
1039378	22	M	12.6	14.6	1.8	108	19	0.82	140	4.54	1.17	17	8	6.9	73	0.5	5.6	0.98	BRADYCARDIA	YES	NO	YES	
1039935	30	M	13	7.9	3.2	90	19	0.63	142	4.5	0.56	42	61	6.7	456	FREE 1.66	FREE 1.09	3.21	SINUS TACHYCARDIA	YES	NO	YES	
1042601	36	M	12	12.2	2.8	152	29	0.85	149	4.32	1.3	63	43	6.8	1669	0.6	7.5	1.02	SINUS TACHYCARDIA	YES	NO	YES	
1043189	35	M	14	19	2.49	200	22	1.3	146	2.98	0.5	36	22	8	199	1.1	11.5	0.99	BRADYCARDIA	YES	NO	NO	YES
1043228	24	M	12	11.4	2.23	97	11	0.78	146	3.57	1.23	23	14	7	729	1.4	13.8	3.72	SINUS TACHYCARDIA	YES	NO	YES	
956864	31	M	13.9	13.9	2.49	97	22	0.88	139	3.87	0.82	25	20	6.7	64	0.6	5.3	1.2	BRADYCARDIA	YES	NO	YES	
957941	24	F	10.9	9.5	2.93	114	18	0.61	142	4.69	0.27	17	10	7.1	292	0.9	5.6	1.5	BRADYCARDIA	YES	NO	YES	
962370	24	M	11.9	5.6	2.47	68	11	0.89	147	4.39	0.49	24	12	7.5	2737	1.8	6.8	2.4	SINUS TACHYCARDIA	YES	NO	YES	
962778	45	M	19.3	18.2	2.62	118	28	0.98	154	3.97	0.88	69	47	7.1	78	0.4	7.4	2.8	BRADYCARDIA	YES	NO	NO	YES
963158	35	F	13.3	21.1	3.99	164	16	0.71	138	4.51	0.84	15	14	6.9	948	0.9	8.4	2.12	NORMAL	YES	NO	YES	
963731	25	F	12.5	14.5	1.76	84	15	0.59	142	3.84	1.19	18	11	6.3	135	1.5	9	2.4	SINUS TACHYCARDIA	YES	NO	YES	
961963	45	M	12.3	15.2	2.39	169	28	1.19	129	4.25	0.45	65	16	6.8	1420	0.8	2.14	1.23	NORMAL	YES	NO	YES	
966082	18	M	14.8	16.4	4.42	104	20	0.9	142	4.05	0.71	17	11	7.6	106	1.6	9	2.4	NORMAL	YES	NO	YES	
966334	22	M	14	10.3	2.72	95	24	0.7	144	4.02	0.73	26	16	6.7	100	0.5	6.8	3	BRADYCARDIA	YES	NO	YES	

973857	28	F	12.5	18.8	2.56	153	13	0.6	142	4.22	0.4	20	11	5.8	138	1.4	12.4	2	NORMAL	YES	YES	YES	
981882	26	M	14.7	10	3.08	91	20	0.8	142	4.35	0.82	22	19	6.9	147	0.3	8.4	2.4	BRADYCARDIA	YES	NO	YES	
982342	38	F	15.3	22.6	3.39	149	22	0.63	137	3.4	0.38	35	31	8.8	2301	0.9	9.4	2.4	SINUS TACHYCARDIA	NO	YES	YES	
983870	50	F	12.9	13.1	3.34	139	16	0.6	137	4.12	0.21	21	10	7.5	298	0.9	6.8	3.6	NORMAL	YES	NO	YES	
1006153	25	M	14.2	18.6	3.4	130	20	0.73	132	4.71	1.05	43	96	5.2	1601	0.5	3.4	2.04	BRADYCARDIA	YES	NO	YES	
1009370	25	M	12.6	9.3	1.94	114	60	1.06	161	3.41	1.12	152	65	5.7	1154	0.3	4.1	2.54	SINUS TACHYCARDIA	YES	NO	YES	
997188	35	M	13.6	13.8	2.91	145	13	0.67	146	2.83	0.48	93	113	8.4	141	0.4	4.8	2.1	BRADYCARDIA	YES	NO	YES	
997621	19	F	11	15.4	2.11	87	4	0.38	138	4.13	0.35	18	10	6.4	176	0.7	4.2	1.48	SINUS TACHYCARDIA	YES	NO	YES	
1000233	69	M	12	7.4	2.93	125	46	0.99	152	3.76	0.36	22	16	6.8	46	0.7	4.7	2.2	SINUS TACHYCARDIA	NO	YES	NO	YES
996125	24	M	13.4	14.8	2.64	164	17	0.74	140	4.35	1.02	29	39	7.2	92	0.6	4.4	2.6	NORMAL	YES	NO	YES	
993755	44	M	13.6	18.6	2.28	177	34	2.31	146	5	0.22	125	73	5.5	167	0.2	3.6	2.4	SINUS TACHYCARDIA	YES	NO	YES	
1004316	22	F	11	15.2	3.03	95	13	0.69	140	3.2	0.5	39	29	6.5	107	0.1	3.2	2.4	SINUS TACHYCARDIA	YES	NO	YES	
1005773	22	F	12.2	17.7	3.82	80	20	0.8	139	4	0.44	54	16	6.4	55	0.6	4.2	2.1	NORMAL	YES	NO	YES	
992906	24	M	13	18.3	3.23	151	35	1.44	139	7.38	0.5	35	45	9.4	904	0.4	4.8	3.9	BRADYCARDIA	YES	NO	YES	
988653	30	M	12.6	20.1	3.46	97	15	0.79	139	4.58	0.67	114	154	7.5	1123	0.7	5.3	1.36	SINUS TACHYCARDIA	YES	NO	YES	
1025922	18	M	12.8	23.1	2.94	141	12	0.49	143	3.74	0.8	72	21	7	67	0.7	7.4	0.33	INCOMPLETE RBBB	YES	NO	YES	
1043214	30	F	13	13	2.8	90	20	0.8	134	4	0.8	35	32	7	800	0.5	4.1	2.6	SINUS TACHYCARDIA	YES	NO	YES	
1004127	36	F	12.4	12.1	2.4	88	20	0.78	134	4.7	0.6	35	30	6.7	1400	0.5	4.1	2.3	SINUS TACHYCARDIA	YES	NO	YES	
1043501	57	M	13.5	14.5	2.57	113	37	1.04	134	3.64	1.48	30	23	5.3	948	0.7	4.4	2.8	BRADYCARDIA	YES	NO	YES	
1044559	24	M	14.7	4.7	2.51	83	12	0.67	137	4.55	1.42	18	10	6.7	1135	FREE2.07	FREE1.29	1.85	NORMAL	YES	NO	YES	
1047806	43	M	8.3	7.7	2.16	106	19	1.16	134	3.91	0.09	7.4	37	17	1254	0.4	5.4	1.29	INCOMPLETE RBBB	YES	NO	YES	
1053450	71	M	13.3	11.8	3.93	153	18	1.32	137	4.54	0.39	6.2	57	66	2453	0.6	6.2	2.3	SINUS TACHYCARDIA	YES	NO	YES	
1053789	64	M	10.4	10.5	4.35	60	70	1.34	139	5.65	0.37	7.2	61	30	279	0.7	9.5	1.35	SINUS TACHYCARDIA	YES	NO	YES	
1053815	76	M	11.3	24.3	2.46	218	13	1.33	137	3.78	1.08	6.9	20	18	358	0.4	5.7	0.17	INCOMPLETE RBBB	YES	NO	YES	
950268	36	M	16.9	21.5	3.51	191	10	0.74	142	2.77	1.01	7.7	41	22	205	0.92	6.4	1.6	BRADYCARDIA	NO	YES	YES	
951987	25	F	12.7	16.8	3.01	109	17	0.53	136	4.06	0.36	6.9	16	13	115	1.2	7.3	1.7	NORMAL	YES	NO	YES	
955134	56	M	13.6	19.5	3.39	137	95	1.7	130	5.17	1.61	6.8	38	30	2968	1.4	7.8	1.6	BRADYCARDIA	YES	NO	YES	
956300	27	F	12.3	7	2.14	245	13	0.62	145	4.56	0.51	6.3	12	10	2146	FREE 2.60	FREE 1.63	0.18	NORMAL	YES	NO	YES	
956298	35	M	13.8	10.4	1.36	128	66	1.63	141	4.3	0.96	6.8	18	10	244	1.1	8	1.48	SINUS TACHYCARDIA	YES	NO	YES	
1053588	80	M	11.4	9.2	2.47	175	24	1.2	138	4.08	0.4	7.2	31	12	1359	1.2	7.8	1.34	SINUS TACHYCARDIA	YES	NO	YES	
1054301	60	F	11.5	9.5	3.11	109	14	0.63	136	4.2	0.24	7.2	35	35	1469	0.4	6.3	2.37	BRADYCARDIA	YES	NO	YES	
1055231	19	F	11.8	12.7	4.42	56	12	0.57	135	4.24	0.21	7.4	17	10	2410	1.3	10.7	0.15	SINUS TACHYCARDIA	YES	NO	YES	
1055160	60	F	13	10.7	2.29	193	58	1.76	136	3.65	0.47	6.7	14	11	2932	1.2	10.2	2.22	SINUS TACHYCARDIA	YES	NO	YES	
990040	32	M	17.7	7.8	1.94	142	29	0.79	141	4.05	0.62	7.6	40	39	189	0.7	9.4	2	BRADYCARDIA	YES	NO	YES	
992417	18	M	12.2	8.3	2.24	112	24	0.56	139	4.53	0.31	7.4	26	13	276	0.9	7.8	1.16	NORMAL	YES	NO	YES	
996342	27	M	16	14.8	3.07	76	20	1.06	143	4.08	0.51	7.7	22	15	165	1.1	8	1.3	SINUS TACHYCARDIA	YES	NO	NO	YES
945161	65	M	14.1	11.1	2.42	88	20	0.91	147	4.03	0.72	7	18	10	70	0.8	9.2	1.3	BRADYCARDIA	YES	NO	YES	
947844	18	F	10.6	16.9	4.32	110	19	0.67	141	4.23	0.4	7.2	20	18	2766	1	8.5	1.6	SINUS TACHYCARDIA	YES	NO	YES	
948312	21	M	9.8	7.4	1.94	114	15	0.81	147	2.85	0.35	7.6	13	10	714	0.7	7.4	2	BRADYCARDIA	YES	NO	YES	
949185	20	F	11.5	14.3	3.25	144	18	0.55	140	4.49	0.42	7.4	16	10	2166	0.9	9.4	1.8	NORMAL	YES	NO	YES	