

A Study of Clinico bio chemical profile of the patients admitted with OP poisoning at tertiary health care centre

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Abstract

Background: The pesticide poisoning like Organophosphorus (OP) is attributed for the death of around 200,000 people each year, largely in the Asia-Pacific region. **Aims and Objectives:** to Study Clinico bio chemical profile of the patients admitted with OP poisoning at tertiary health care centre. **Methodology:** After approval from institutional ethical committee a cross-sectional study was carried out in the patients with history of ingestion of Organo phosphorus compounds (OP), accidental or suicidal brought to casualty or admitted to the department of Medicine during the one year period i.e. March 2016 to March 2017. The severity of poisoning was determined by Pseudo cholinesterase level Severe (≤ 700 IU), Moderate (701-14,00 IU), Mild (1401-3500 IU), Latent (>3500 IU). The statistical analyses done by Chi -square test calculated by SPSS 19 version software. **Result:** In our study we have seen that The majority of the patients were in the age group of 30-40 i.e. 28.36% , followed by 40-50, 25.37%, 50-60 were 19.40%, >60 were 16.42%, 20-30 were 10.45%. The majority of the patients were Male i.e. 55.22% followed by Female i.e. 44.78%. The most common symptoms were Impaired , blurry vision -90%, Excess saliva-85%, Muscle weakness-75%, Dizziness -72%, Coughing and wheezing-68%, Difficulty in breathing-32%, Muscle twitching and tremor-29%, Irregular heartbeat-21%, Respiratory depression -19%. The majority of the patients with severe type of poisoning were having poor outcome or death i.e. 57.89 % as compared to Recovered were 42.62%, in Moderate- the Death or Poor outcome was 31.82 % and Recovered were 68.18%, in Mild Death or Poor outcome were 10.53 % and Recovered were 89.47%, in Latent it was - Death or Poor outcome 0% and 100% recovered. This difference of mortality with respect to severity of poisoning on Pseudo cholinesterase level was statistically significant ($X^2=14.62, df=3, p<0.002$). **Conclusion:** It can be concluded from our study that The majority of the patients were in the age group of 30-40, most common symptoms were Impaired, blurry vision , Excess saliva, Muscle weakness, Dizziness , the pseudo-choline esterase level significantly associated with the poor outcome or mortality in the patients .

Key words: OP poisoning, pseudo-choline esterase level, Organo-phosphorus compounds.

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INTRODUCTION

The pesticide poisoning like Organophosphorus (OP) is attributed for the death of around 200,000 people each year, largely in the Asia-Pacific region. OP poisoning is primarily a problem of the developing countries India being predominantly an agricultural country; pesticides, insecticides are abundantly used during cultivation. Thus it has been natural to have easy access to these chemical substances by human beings ^{1,2}. Of the various substances used for suicidal attempts in India, Organophosphorus compounds form a significant group. The WHO estimates that each yearly nearly ³ million serious accidental and nearly 2 million suicidal attempts involving pesticides occur worldwide. In developing

countries, the widespread use of organ phosphorus compounds has been accompanied by an appreciable increase in incidence of poisoning with these agents, both suicidal and accidental. This is attributed mainly to their easy availability, indiscriminate handling, storage and lack of knowledge about the serious consequences of poisoning¹

Methodology: After approval from institutional ethical committee a cross-sectional study was carried out in the patients with history of ingestion of Organo phosphorus compounds (OP), accidental or suicidal brought to casualty or admitted to the department of Medicine during the one year period i.e. March 2016 to March 2017. All details of the patients like age, sex, clinical features were noted. The severity of poisoning was determined by Pseudo cholinesterase level Severe (≤ 700 IU), Moderate (701-14,00 IU), Mild (1401-3500 IU), Latent (>3500 IU). The statistical analyses done by Chi – square test calculated by SPSS 19 version software.

RESULT

Table 1: Distribution of the patients as per the age

Age	No.	Percentage (%)
20-30	7	10.45
30-40	19	28.36
40-50	17	25.37
50-60	13	19.40
>60	11	16.42
Total	67	100.00

Table 4: Distribution of the patients as per the severity by Pseudo cholinesterase and Outcome

Severity (Pseudo cholinesterase level)	Recovered	Death or Poor outcome	Total
Severe (≤ 700)	8 (42.62)	11 (57.89)	19 (100.00)
Moderate (701-14,00)	15 (68.18)	7 (31.82)	22(100.00)
Mild (1401-3500)	17 (89.47)	2 (10.53)	19(100.00)
Latent (>3500)	9 (100.00)	0 (0.00)	9(100.00)
Total	49 (71.01)	20 (28.99)	69(100.00)

($\chi^2=14.62, df=3, p<0.002$)

The majority of the patients with severe type of poisoning were having poor outcome or death i.e. 57.89 % as compared to Recovered were 42.62%, in Moderate the Death or Poor outcome was 31.82 % and Recovered were 68.18%, in Mild Death or Poor outcome were 10.53 % and Recovered were 89.47%, in Latent it was -Death or Poor outcome 0% and 100% recovered. This difference of mortality with respect to severity of poisoning on Pseudo cholinesterase level was statistically significant ($\chi^2=14.62, df=3, p<0.002$).

DISCUSSION

Thousands of tons of acetylcholinesterase enzymes (AChEs)-inhibiting carbamates and organophosphate (OP) pesticides are used throughout the world for agricultural application as insecticides. The toxicity is attributed to

The majority of the patients were in the age group of 30-40 i.e. 28.36% , followed by 40-50 25.37%, 50-60 were 19.40%, >60 were 16.42%, 20-30 were 10.45%.

Table 2: Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Male	37	55.22
Female	30	44.78
Total	67	100.00

The majority of the patients were Male i.e. 55.22% followed by Female i.e. 44.78%.

Table 3: Distribution of the patients as per the symptoms

Symptoms	No.	Percentage (%)
Impaired , blurry vision	62	90%
Excess saliva	59	85%
Muscle weakness	52	75%
Dizziness	50	72%
Coughing and wheezing	47	68%
Difficulty breathing	22	32%
Muscle twitching and tremor	20	29%
Irregular heartbeat	14	21%
Respiratory depression	13	19%

The most common symptoms were Impaired , blurry vision -90%, Excess saliva-85%, Muscle weakness-75%, Dizziness -72%, Coughing and wheezing-68%, Difficulty in breathing-32%, Muscle twitching and tremor-29%, Irregular heartbeat-21%, Respiratory depression -19%.

their ability to inhibit AChE that inhibits the activity of neurotransmitter agent acetylcholine (ACh).⁵ AChE activity can be measured in the serum and red blood cells. In India, OP compounds are easily accessible; therefore, it is the most common mode of poisoning fatalities as a source of both intentional and unintentional poisoning.⁶ Patients exhibit muscarinic and nicotinic symptoms depending upon severity of compounds. Muscarinic symptoms such as nausea, vomiting, diarrhea, sweating, salivation, urination, stool incontinence, lacrimation, miosis, and bradycardia and nicotinic signs such as muscular weakness, fasciculation, paralysis, convulsion, and coma are found.⁷ OP compounds lead to acute and chronic complications. Acute complications include acute respiratory failure, acute respiratory distress syndrome (ARDS), types I and II paralysis, intermediate syndrome

(IMS), sudden cardiac death, aspiration pneumonitis, and resecretions. Chronic complications include anxiety, depression, polyneuropathy, paralysis, and coma.⁸ Poisoning with these compounds is very serious and requires treatment in intensive care unit as they present with life-threatening complications and may result in mortality. It also affects respiration, which may endanger the individual's life. Mortality rates depend upon amount and type of compound, condition of patient on arrival at hospital, delay in diagnosis and treatment, and respiratory management. There was always correlation with type of compounds, prehospitalization period, and the type of management, and they are useful for preventing the mortality rate in developing countries such as India.⁹ Treatment includes early resuscitation with oxygen, airway protection, intravenous fluids, muscarinic antagonist such as atropine, and acetyl cholinesterase activator such as PAM.⁸ Gastric lavage could have a role but should only be undertaken once the patient is stable. Patients must be carefully observed after stabilisation for changes in atropine needs, worsening respiratory function because of IMS, and recurrent cholinergic features occurring with fat-soluble organophosphorus compounds.¹⁰

In our study we have seen that The majority of the patients were in the age group of 30-40 i.e. 28.36% , followed by 40-50, 25.37%, 50-60 were 19.40%, >60 were 16.42%, 20-30 were 10.45%. The majority of the patients were Male i.e. 55.22% followed by Female i.e. 44.78%. The most common symptoms were Impaired , blurry vision -90%, Excess saliva-85%, Muscle weakness-75%, Dizziness -72%, Coughing and wheezing-68%, Difficulty in breathing-32%, Muscle twitching and tremor-29%, Irregular heartbeat-21%, Respiratory depression -19%. The majority of the patients with severe type of poisoning were having poor outcome or death i.e. 57.89 % as compared to Recovered were 42.62%, in Moderate- the Death or Poor outcome was 31.82 % and Recovered were 68.18%, in Mild Death or Poor outcome were 10.53 % and Recovered were 89.47%, in Latent it was -Death or Poor outcome 0% and 100% recovered. This difference of mortality with respect to severity of poisoning on Pseudo cholinesterase level was statistically significant ($X^2=14.62, df=3, p<0.002$). This was similar to Nehal M Shah¹¹ they found that maximum incidence of OP poisoning was in between 20 and 40 years age group (60%), and male to female ratio was 2:1. Clinical signs such as bradycardia and tachycardia were present in 20% cases. Miosis was present in 70% cases, and it is more dangerous. Low serum AchE level was found in 68% cases, with mortality in 44.62% among them. Type-I paralysis (52%) and acute

respiratory failure (32%) were found as life-threatening complications. In our study, 64% patients survived also maximum mortality was noted in those patients who had low serum AChE level on admission , also noted that maximum mortality was at <400 IU / ml of serum choline esterase^{12,13}

CONCLUSION

It can be concluded from our study that The majority of the patients were in the age group of 30-40, most common symptoms were Impaired, blurry vision , Excess saliva, Muscle weakness, Dizziness , the pseudo-choline esterase level significantly associated with the poor outcome or mortality in the patients .

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