

Clinical Profile in Patients of Organophosphorous Poisoning

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Abstract: Aim: To study the clinical profile and correlation between acetylcholinesterase level in the patients of organophosphorous poisoning in reference to outcome. Method: 100 patients of organophosphorous poisoning were taken of age above 12 years, irrespective of sex. All patient underwent detailed clinical examination .lab investigation of serum cholinesterase level were done. Their progress and ventilator support was considered as and when required. Observation: it was observed that low serum cholinesterase level has highest requirement of ventilator support and mortality. More the time lag, higher is the risk of ventilator requirement and higher mortality. Lesser the pupil size higher is mortality. Conclusion: Organophosphorous poisoning is one of the most common cause of mortality among young adults. Early identification of signs and clinical examination along with lab investigation like serum cholinesterase level will help to prevent mortality. Timely use of mechanical ventilator can also save life.

Keywords: ventilator, miosis, acetylcholinesterase, timelag, respiratory depression

1. Introduction

Organophosphorous compounds are used worldwide in agriculture as well as in house and domestic insecticides. This easy availability of the compounds has resulted in increase in accidental and suicidal poisoning mainly in developing countries¹.The worldwide mortalities and chronic illness due to pesticide poisoning number about 1 million per year. Organophosphorous compounds are responsible for the maximum (73%) among them³.The mortality rate of organophosphorous poisoning is high⁴. The leading cause of death in organophosphorous poisoning is respiratory failure, which results from combination of respiratory muscle weakness, central respiratory depression, increased bronchial secretions, bronchospasm and pulmonary edema⁴.The present study was undertaken to identify the factors which helped in predicting the need for ventilator support, monitoring and outcome of the patients.

2. Aim

To study the clinical profile and correlation between acetylcholinesterase level in the patients of organophosphorous poisoning in reference to outcome.

3. Material & Methods

The present study was carried in New Civil Hospital, Surat during the period of Jul'2005 to Aug'2006. 100 patients of organophosphorous poisoning admitted to our hospital were included in the study.

Patients were selected irrespective of sex. The age group included were above 12 years. Patients with other associated illness or conditions likely to accentuate the respiratory failure were excluded from the study. Patients with multiple agent poisoning are also excluded. A provisional diagnosis of organophosphorous poisoning was made on the basis of history, examination of container and typical clinical features. Serum acetylcholinesterase level was measured. Normal values of laboratory were between 3000-6000 IU/lit. According to classification of severity of poisoning was defined as :

Severe → serum acetylcholinesterase <300 IU/lit
Moderate → serum acetylcholinesterase 300-600 IU/lit
Mild → serum acetylcholinesterase 600-1500 IU/lit
Very mild → serum acetylcholinesterase >1500 IU/lit

All patients were monitored closely and all clinical signs were assessed 12 hourly till complete recovery. Ventilatory support was considered in patients as and when required.

4. Results

Table 1: Table showing age and sex wise distribution in patients of organophosphorous poisoning

Age group (years)	Sex		Total (%)
	Male (%)	Female (%)	
11-20	9 (9%)	7 (7%)	16 (16%)
21-30	28 (28%)	20 (20%)	48 (48%)
31-40	12 (12%)	9 (9%)	21 (21%)
≥ 41	13 (13%)	2 (2%)	15 (15%)
Total	6	38	100

In this study, 62% (62 cases) were male and 38% (38 cases) were female. The male to female ratio was 1.6:1.

Table 2: Table showing symptomatology in patients of organophosphorous poisoning

Symptomatology	No. of cases (%)
Nausea & vomiting	86 (86%)
Pain in abdomen	34 (34%)
Altered sensorium	32 (32%)
Giddiness	20 (20%)
Convulsion	12 (12%)
Breathlessness	21 (21%)
Salivation	19 (19%)

Nausea and vomiting were the commonest symptoms 86% of cases followed by pain in abdomen about 34% and altered sensorium in about 32% of cases. CNS manifestation in form of convulsion seen in 12%.

Table 3: Table Showing signs in patients of organophosphorous poisoning

Signs	No. of cases (%)
Typical smell in breath	83 (83%)
Increased respiratory secretion	19 (18%)
Tachypnea	17 (17%)
Bradycardia	55%
Increased blood pressure	9 (9%)
Miosis	42 (42%)
Disturbed consciousness	52 (52%)
Fasciculation	36 (36%)

Typical smell in breath was seen in (83%) of cases, miosis in (42%) of cases, disturbed consciousness in (52%) of cases and fasciculations in (36%). Respiratory failure in form of tachypnea, shallow respiration and bronchospasm were present in (17%). Cardiovascular manifestations in form of bradycardia was present in 55%.

Table 4: Table showing relation of S. Acetylcholinesterase level and mortality

S. Acetylcholinesterase (IU/L)	No. of patients (%)	No. of patients expired (mortality) (%)
< 300	3 (3%)	2 (66%)
300-600	5 (5%)	2 (40%)
600-1500	21 (21%)	10 (47.6%)
≥ 1500	71 (71%)	6 (8.4%)

Highest mortality noted (66%) in patients with lowest level of acetylcholinesterase (<300iu/l). Among 71% (71 cases) with serum acetylcholinesterase level ≥ 1500, only 8.4% (6 cases) mortality was noted. All patients with lowest level needed ventilator support (100%).

Table 5: Table showing relation of time lag to treatment with mortality

Time lag to treatment	No. of cases (%)	Mortality (%)
< 1 hr	17 (17%)	1 (5.88%)
1-4 hr	42 (42%)	4 (9%)
≥ 4 hr	41 (41%)	15 (36%)

The above table shows that 17 cases (17%) presented in less than 1 hour and out of them, mortality was noted only in 1 patient (5.88%). 4 patients (9%) expired among 42 patients (42%) who received treatment within 1-4 hours of ingestion of poison, 41% of patients presented in more than 4 hours of ingestion of poison and among them 15 patients (36%) expired. Our study shows that mortality was 100% in patients with GCS score between 3-6. 46.8% mortality (15 patients) was seen in patients with GCS score between 7-10 and only 5.9% mortality (4 cases) was seen in patients with GCS score between 11-15. In present study, the mortality was high with lower GCS score. Our study also shows that 1 patient presented with GCS score between 3-6 and required ventilatory support. Among 32 patients who presented with GCS score between 7-10, 90.6% (29 cases) required ventilatory support. 67 patients presented with GCS score between 11-15 and among them 19.4% patients required ventilatory support. Level of serum acetylcholinesterase showing interesting results.

Table 6: Table showing relation of pupil size with mortality rate

Size of pupil (mm)	Cases	Mortality
	No.	No. %
≤ 1	21 (21%)	12 (57.1%)
2-3	32 (32%)	7 (21.8%)
≥ 4	47 (47%)	1 (2.12%)

The above table shows that among 21 patients who presented with pupil size ≤ 1 mm the mortality rate was 57.1% (12 cases). Mortality rate was 21.8% (7 cases) among the 32 patients who presented with pupil size 2-3 mm and out of the 47 patients who presented with pupil size ≥ 4mm, mortality rate was 2.12% (1 case). The study also shows that higher initial requirement of atropine (>60mg) is seen in 25% of patients in whom ventilator requirement is also high (23%) as compared to low requirement (18%) is associated with no requirement of ventilator.

5. Conclusions

- **Poisoning are common cause of mortality in young adults. Identification of patients early may save the young life. Clinical history and examination with n with cholinesterase level can help to identify the patients at risk of mortality in organophosphorus poisoning.** In present study male versus female ratio was 1.6:1 which corresponds with the study by Tsao et al⁵, who found the ratio to be 1.2:1 and Friedman LM¹² found the ratio to be 1.9:1 which had 64 males and 33 females. Alina Weissmann-Brenner³ in her study had male to female ratio of 1.9:1.
- **In our study nausea and vomiting were the commonest symptoms. Altered sensorium was observed in 32% of cases comparable to Goel et al². Which was 45% and 54% as per Tsao et al⁸ study. Other symptoms were breathlessness, convulsion, giddiness...**
- **In our study miosis, disturbed consciousness, tachypnea, shallow respiration, fasciculation, bradycardia is noted comparable to Goel et al and Tsao et al study.**
- **In our study mortality was more i.e 66% with low serum cholinesterase level < 300 IU/lit comparable to Tsao et al study.** In this study we observed that those patients who received treatment in less than 1 hr, mortality was low comparable to Tsao et al study.
- **In present study, miosis was observed in 42% of cases and it was in 95% of cases in the study done by Goel et al². Tsao et al⁵ in their study observed miosis in 83% of cases.**

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