

Organophosphorus:

Most pesticide contains organophosphorus or carbamate compound. Both chemicals inhibit acetylcholinesterase resulting in increased level of acetylcholine in body. Its effects include:

- ** CNS effects: anxiety, seizure
- ** Nicotinic effects at neuromuscular junction and autonomic ganglia:
- ** Muscle weakness, twitching, tachycardia.
- ** Peripheral muscarinic effects: Salivation, Sweating, diarrhea, bradycardia, small pupils. Fortunately it is controlled with atropine³ and pralidoxime. Atropine is given at dose of 0.6 to 2mg every 10-20 minutes till atropinizaion. Heart rate >70 and drying of oropharyngeal secretion are more reliable than pupillary size in deciding adequacy of atropine

Carbamate:

It has similar effects to organophosphorus but is easily reversed⁴ and pralidoxime is not indicated.

Organochlorine:

It causes excitation of central and peripheral nervous system. Clinical feature are headache, nausea, vomiting, parasthesia, twitching, seizure and cardiac arrhythmias⁵. Treatment include protection of airway, adequate oxygenation, control of seizer with diazepam, i/v fluids and control of arrhythmias⁶.

Pyrethroids:

These are toxic to nervous system. Clinical feature are vomiting, tremor, incoordination, salivation and seizure. They can cause allergic reaction eg bronchial asthma. Treatment includes skin decontamination, seizure control and antiallergy therapy⁶.

Herbicides:

It causes uncoupling of oxidative phosphorylation resulting in high metabolic rate. Ingestion causes nausea, vomiting, pyrexia, hyperventilation, excessive sweating, hypoxia, restlessness and coma.

Treatment includes supportive care and alkaline diuresis for elimination of herbicide⁷.

Cases of unknown pesticide poisoning are reported in this hospital. Label of pesticide is not available all the time. Physician relies on history

and signs symptoms of group of pesticide for diagnosis & treatment.

METHODS:

This prospective study was conducted in department of medicine, unit II, Peoples University of Medical & Heath Science Nawabshah from January 2015 to December 2015. A total of 160 patients with acute pesticide poisoning were admitted. Patients were quickly assessed and name and nature of pesticide was enquired. Attendants were asked to bring label or container of pesticides. At the same time patients were examined for signs and symptoms of any group of pesticide. Name of pesticide was checked in booklet which contains generic and commercial names of pesticide available in Pakistan. Diagnosis was made and treatment started. Gastric lavage was done. If clothes were contaminated, these were removed and skin washed with soap and water. Antidote was started. If patients having respiratory insufficiency then they were shifted to ICU for respiratory support. Later availability of label or information about pesticide on telephone from reliable source was helpful in undiagnosed cases and treatment was then changed accordingly.

Majority of patients were of organophosphorus group. For this atropine and pralidoxime were given till atropinizaion. For herbicide poisoning along with other supportive therapy alkaline diuresis with sodium bicarbonate 1.26% 500ml hourly for three hours was given. For other groups supportive therapy was given.

RESULTS:

Out of 160 patients admitted 90 were male. Their age ranged from 16-50 years (Table-1). They belonged to low to middle socio economic group. Signs and symptoms are given in table No 2. According to history, signs and symptoms and availability of label of pesticide, 112(70%) patients were exposed to organophosphorus and Carbamate, 28(17.5%) patients were exposed to pyrethroid, 4(2.5%) patients were exposed to organochlorine and 8(5%) patients were exposed to herbicide poisoning. In 8(5%) patients no cause was known.

Small pupils, salivation, sweating bradycardia, increased bronchial secretion were common features of organophosphorus poisoning.

Diarrhea, tremor, seizure, incoordination, salivation, and vomiting were common in pyrethroid group. Pyrethroid are sometimes misdiagnosed as organophosphorus (OPP) poisoning because of similar features.

Twitching, fits, tachycardia and vomiting were common in organochlorine group.

Excessive sweating, fever, tachycardia and hyperventilation were common in herbicide group.

Out of these 20(10.5%) patients expired. Cause of death was respiratory failure, shock and uncontrolled fits.

These clinical factor are specific in most of poisoning but some may overlap.

Table 1: Demographic Data (n160)

S. No.	Parameter	No. of Patients	%
01	Male	90	56.25
02	Female	70	43.75
03	Age	16 to 50	
	mean \pm SD	33 \pm 17	

DISCUSSION:

Results of this prospective study showed that 160 patients were admitted with pesticide poisoning during 1 year of study in one medical ward. No of male patients was more than female and their age ranged from 16 to 50 years. All belonged to low to middle socio economic group. Worldwide 99% of cases of pesticide poisoning belonged to low to middle income countries⁸. Majority of cases of pesticide poisoning belonged to Organophosphate and carbamate group followed by Pyrethroid, Herbicide, and Organochlorine group.

All patients had taken pesticide for suicidal purpose. Pesticide is preferred way of committing suicide in rural areas because it is cheap, easy available and certain way of suicide. Male were more affected than female because they have easy access to pesticide. Female also become victim easily because pesticide is available in homes of farmers.

Self poisoning with pesticide accounts for 50% to 75% of all deaths in female between 10-19 years in south india⁹ and 14% of all death in females in age of 10 to 50 years in Bangladesh¹⁰.

Mortality rate in this study was 10.5%. It is similar to 10 to 20% in rural asia¹¹ and 9.2% in Bangladesh¹².

There was difficulty in identifying pesticide because (1) label or container was not brought (2) some victims used old pesticide without label and they threw away container after ingestion of pesticide (3) there is no facility for chemical analysis from laboratory. Therefore we concentrated on history and signs and symptoms for identification of pesticide.

Small pupils and increased bronchial and salivary secretion were important clue of organophosphorus poisoning. In 10% of patients with organophosphorus poisoning pupils may be of normal size or increased in size due to nicotinic action¹³. Similarly bradycardia was not present in all cases of organophosphorus poisoning. It is late signs. Fear and anxiety can cause initial tachycardia¹⁴. Tachycardia may be due to nicotinic action.

It is a fact that if label or container is not available then all cases of pesticide poisoning are labelled as organophosphorus poisoning and treated with atropine. Atropine is indicated only in organophosphorus and carbamate poisoning and in other poisoning it may cause toxicity. Atropine is clearly contraindicated in herbicide poisoning¹⁵.

As rapid chemical analysis is not possible even in developed countries, Physician should use toxicologic identification approach for rapid assessment, decision making and treatment of poisoned patient¹⁶.

An important observation during treatment of organophosphorus poisoning with atropine was that pupil became dilated early while pulse was still slow. In this situation we should rely on pulse rate and drying of secretion for atropinization omitting pupillary signs.

During treatment of organophosphorus poisoning we should closely monitor patients and watch for signs of atropinization. Over dosage of atropine can lead to atropine toxicity and can be fatal.

Table-2. Clinical Features Observed in Patients with Acute Pesticide Poisoning (n=160)

S. No.	Symptoms Signs	No. of Patients	%
01	Small pupils	96	60
02	Bradycardia	80	50
03	Salivation	82	51.25
04	Increased bronchial secretion	80	50
05	Sweating	77	48.12
06	Vomiting	74	46.25
07	Diarrhea	12	7.5
08	Twitching	33	20.62
09	Muscle weakness	30	18.75
10	Respiratory difficulty	60	37.5
11	Seizure	31	19.37
12	Tachycardia	44	27.5
13	Pyrexia	8	5
14	Headache	10	6.25
15	Incoordination	28	17.22
16	Hyperventilation	24	15
17	Arrhythmias	10	6.25
18	Confusion, coma	28	17.5

Table-3: Different Groups of Pesticide Identified by Clinical Presentation

S. No.	Pesticide Identified by Clinical Presentation	No. of Patients	%
01	Organophosphorus & Carbamate	112	70
02	Organochlorine	4	2.5
03	Pyrethroid	28	17.5
04	Herbicide	8	5
05	Unknown	8	5

CONCLUSION:

Cases of pesticide poisoning are increasing due to easy availability of pesticide at lower cost. When label or container of pesticide is not available, Physician should identify group of symptoms of particular class of pesticide in poisoned patients for rapid decision making and treatment. Health care providers should be

supplied with a booklet/or register containing generic and commercial names of pesticide for rapid identification and treatment of poisoning.

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