



## TYPES OF POISONING, MANAGEMENT AND COUNSELLING INFORMATION – A REVIEW

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### **Abstract**

Poisoning is a significant public health problem all over the world. Acute poisoning is a major cause for visits to emergency departments and calls to poison information centers throughout the world. The earlier initial resuscitations, gastric decontamination and use of specific antidotes are the better the outcome. Poison is a substance that causes damage or injury to the body and endangers one's life due to its exposure by means of ingestion, inhalation, or contact. The annual incidence of unintentional acute poisoning cases exceeds 1 million. Furthermore, the establishment and strengthening of poisons centres is one of the priority actions for governments to enhance health sector engagement in the Strategic Approach to International Chemicals Management. Most of the studies concluded with the need to establish a poison information centre for the better management and prevention of poisoning cases.

**Key Words:** Poison, Prevention, Intentional and Unintentional, Patient Counselling.

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### **INTRODUCTION**

The word Poison is derived from Latin word "Potare" means to drink. Any substance including drug that is harmful to a living organism. It will cause death, by its local or systemic action or both<sup>1</sup>.

Poisoning from pharmaceuticals, industrial chemicals, pesticides, chemical products and natural toxins is a significant global public health problem. WHO seeks to build capacity in countries to deal with these problems, and an important area of activity is promoting the establishment and strengthening of poisons centres. WHO provides guidance for the

strengthening the role of public health in chemical incident and emergency prevention, preparedness, detection, alert, response and recovery, particularly for developing countries and those with economies in transition. A poisons centre is a specialized service that advises on the diagnosis and management of poisoning and collects data to inform poisons prevention activities. Poisons centres play an important role in identifying and assessing the toxic risks in a population, e.g. from emerging toxicological hazards is called toxicovigilance<sup>2</sup>.

### **Types of Poisoning:**

Poisoning can be divided into 4 broad categories are,

- 1. Pharmaceuticals:** Paracetamol, Aspirin, Benzodiazepines, Phenytoin, Barbiturates, Opioids etc,
- 2. Insecticides and Pesticides:** Organophosphate, Chlorine, Superwarfarin, Furadon, Endosulphan.
- 3. Plants and Animals:** Snake or Scorpion bite, Bees or Wasps sting, Oleander, Datura and Oduvanthalai.
- 4. Chemicals:**
  - a) Inorganic Substances:** Mercury, Arsenic, lead, copper, sulfur and hair dye (Paraphenylenediamine).
  - b) Organic Compounds:** Rotenone, Pyrethrum, Nicotine and Neem oil.
  - c) Biological Compounds:** Bacteria and Viruses.

Based on its pharmacological action poisoning can be classified into three stages are,

- 1. Fulminant:** Produced by a massive dose of a poison. Death occurs very rapidly, without symptoms i.e., collapse suddenly
  - 2. Acute:** A single large dose or several small doses taken in a short period.
  - 3. Chronic:** Produced by small doses taken over a long period
- General Management of Poison.

Poisons classified under the mode of action are collectively subdivided into **Corrosive, Irritants, and Systemic Poisons.**

- 1. Corrosive Poisons:** It is a highly active irritant and not only produces an irritant but also actual ulceration of the tissue. They generally consist of strong acids and strong alkaloids.
- 2. Irritant Poisons:** It causes pain in abdomen, Vomiting and purging. It was further divided into three categories are,
  - a) Inorganic Irritant Poisons:**

It consists of inorganic subgroup such as Metallic poisons and Non-metallic poisons.

**b) Organic Irritant Poisons:**

This group of poisons comprises of animal and plant poisons.

**c) Mechanical Irritant Poisons:**

This group indicates coarsely powdered glass, chopped hairs, dried sponge and Diamond dust.

**3. Systemic Poisons:**

This class of poisons directly affects the main organs of the body system and therefore they are referred to as systematic poisons. It includes nervous system, Cardiovascular system, Respiratory System.

- **Neurotic Poisons:** It acts chiefly on the nervous system through some neurotics have a local irritant action. All alkaloid poisons can act this group.
- **Cerebral Poisons:** This poison acting on cerebrum may have a somniferous, inebriant or deliriant effect. It includes Opioids, Alcohol, Anaesthetics, Sedatives and Hypnotics.
- **Spinal Poisons:** This poison acting on spinal cord includes Mux vomica and its alkaloids and Gelsemium.
- **Peripheral Poisons:** This poisons acting on peripheral nerves include Curare and Conium.
- **Cardiac Poisons:** This is the poisons acting on the heart and it includes digitalis, oleander, aconite and nicotine.
- **Asphyxiate Poisons:** These poison acts on the respiratory system and it include irrespirable gases such as carbon monoxide, carbon dioxide, sewer gases and some war gases.
- **Miscellaneous Poisons:** This poisons having different pharmacological action are put together in this group. It includes analgesic, antipyretics, antihistaminic, antidepressants, street drugs and designer drugs<sup>3</sup>.

**Other Classifications:**

Unlike the classifications described above, there is usually no predictive value in classification by target sites or by uses.

Such classifications are done, however, to systematically categorize the numerous known poisons.

Target sites include the nervous system, the cardiovascular system, the reproductive system, the Immune system, and the lungs, liver, and kidneys<sup>4</sup>.

**Common Causes of Poisoning:**

- Pain killers,
- Cosmetics or personal products,
- Household cleaning products,
- Sedatives, hypnotics and antipsychotics medicine,
- Foreign bodies, toys and other object.

**Follow these first aid steps for different types of poison<sup>5</sup>:**

- **Swallowed poisons:** Do not give the person anything to eat or drink before calling the Poison Control Centre.
- **Inhaled poisons:** Get the person to fresh air right away.
- Poisons on the skin.
- Poisons in the eye.

**Organophosphorus Poisoning:**

Organophosphate poisoning is poisoning due to Organophosphates (OPs). Organophosphates are used as insecticides, medications and nerve agents. Accidental exposure or overexposure to pesticides can have serious implications. The potential for pesticide accidents is real. Some are extremely toxic and require special precautions.

Various types of pesticides that cause poisoning are: Insecticides, Rodenticides, Fungicides, Nematicides, Acaricides, Molluscicides and Herbicides.

Organophosphates (OPs) are lipophilic compounds formulated in petroleum distillates as emulsifiable concentrates or suspensions. Wettable powders, dusts and granules are also available.

**Other Names:**

Organophosphate toxicity, Organophosphate overdose.

**Symptoms:**

Increased saliva and tear production, diarrhea, vomiting, small pupils, sweating, muscle tremors and confusion.

**Prevention:**

To make decrease in excess of organophosphorus substances. Prevention efforts include banning very toxic types of organophosphates. Among those who work with pesticides the use of protective clothing and showering before going home is also useful<sup>6</sup>.

**Clinical features:**

Muscarinic effects in moderate to severe poisoning include miosis, salivation, lacrimation, urination, defecation, gastrointestinal distress, emesis, bronchorrhea, bronchoconstriction, diaphoresis, bradycardia and hypotension.

Bronchorrhea and bronchoconstriction may lead to compromised pulmonary functions including non-cardiogenic pulmonary edema along with chemical pneumonitis due to aspiration of hydrocarbon vehicle.

Nicotinic effects include muscle fasciculations, cramps, hypertension, tachycardia, pupillary dilatation, weakness that can progress to areflexia and paralysis<sup>7</sup>.

**Medications:**

Some of the medication used in organophosphate poisoning is Atropine, Oximes such as Pralidoxime and Diazepam.

General measurements such as oxygen and Intravenous fluids are recommended.

Another diagnostic method used in organophosphate poisoning is Carbamate Poisoning.

**Deaths:**

Greater than 2,00,000 per year.

**Diagnostic Tests**

Laboratory evaluation is indicated in the following cases:

- Any intentional ingestion,
- When the ingested substance is unknown,
- When the toxin has the potential to produce moderate to severe toxicity,
- The patient has more than minimal symptoms<sup>8</sup>.

**Poison Control:**

The poison can control to make a hospital treatment by using some medications are

1. **Antidotes:** It is mostly used for neutralize poison substance. These are the substances that either prevent the poison from working or reverse its effects. **E.g.** Atropine, Caffeine, Theophylline.
2. **Anti-epileptic Medicine:** It may be used if the person has seizures.

- 3. Sedatives:** It may be given if the person is agitated in a ventilator, may be used if the person stops breathing.

Diagnosis is primarily clinical, but for some poisonings, blood and urine tests can help. Treatment is supportive for most poisoning; Prevention includes labeling drug containers clearly and keeping poisons out of the reach of children. Most poisonings are dose-related.

In India, the National Poisons Information Centre (NPIC) was established in February, 1995 in the Department of Pharmacology at the All India Institute of Medical Sciences, New Delhi.

The centre provides toxicological information and advice on the management of poisoned patients adapted to the level of the enquirer. The basis of this service is the databases on poisoning, drug reactions and also the continuous and systematic collection of data from the library. This information service is available round the clock<sup>9</sup>.

### **Managing Common Complications:**

Complications of poisoning are relevant to clinical toxicologists for two reasons: **Organ toxicity** affecting major organs such as the heart, respiratory tract, kidneys and liver present problems in assessment and management on a regular basis in poisoned patients<sup>10,11</sup>.

Complications of poisoning may assist the clinician as poisons may produce specific syndromes based on their Pharmacological properties. Common complications of poisoning include depressed mental status, Coma and altered conscious state, seizures, delirium and agitation, hypotension, bradycardia and vomiting.

Most of these can be treated empirically without knowledge of the toxin involved and without specific antidotes. Management of these complications occurs with history, physical examination and specific laboratory tests<sup>12</sup>.

### **Patient Counseling:**

Patient counseling for up taken poison was observed into two types are

1. Intentional Poisoning.
2. Unintentional Poisoning.

#### **1. Intentional Poisoning:**

Management of poisoned patients begins with supportive care, assessment of organ function and dysfunction, and consideration of known or suspected poisons. The possibility of multiple ingestions should be considered with intentional exposures or suicide attempts.

Data were collected from patient's case sheets and transferred to data entry format for evaluation. All the data were collected from the medical record department. The majority of poison cases were between 21 - 30 years of age.

The general medicine, paediatricians and emergency care department cases from the medical record department were selected for the study as there were many cases of different poisonings being admitted for the treatment of poison with various comorbid conditions. They must have focused by supportive care till the correct substance is identified. The plan of management is to provide supportive care, Prevention of poison absorption, use of antidote wherever is indicated to advice the patients<sup>13</sup>.

The patient must have counseling for live her life and give support to don't taken poison again.

## **2. Unintentional Poisoning:**

If any poison substance can enter unintentionally into the body, contact Poison Control helpline through website at [www.poison.org](http://www.poison.org) or National Poison Information Center.

Poison control centres are excellent resources for poisoning information and, in many situations, may advise that in-home observation is all that's needed.

To make an immediate hospital treatment is prevention of poison can neutralize into the body.

### **Safety Precautions to avoid unintentional Poisoning<sup>14,15</sup>:**

- 1) Keep all household products in their original bottles.
- 2) Lock up chemicals in a safe place.
- 3) Never mix chemicals.
- 4) Before putting away any medicines, cleaners or chemicals, make sure the lid is tight and secure.
- 5) Teach your children about the dangers.
- 6) For prescription medicines, always read the label.
- 7) Dispose of old medicines.
- 8) Never call medicine "Candy".
- 9) Put all medicines, Cleaners and Chemicals away after using.

## **CONCLUSION**

Poisoning is frequent in India and carries a high mortality and morbidity. Aggressive resuscitation and the use of antidotes where available are the keys to reducing mortality. Poisoning is diagnosed on the basis of history and clinical examination biochemical

investigations can have a role for confirming the diagnosis. It is important to sensitize physicians working in the periphery and rural hospitals to advances in the diagnosis and management, as newer means become available to fight the morbidity and mortality induced by poisoning. On-going monitoring and high quality supportive cares are essential healthcare staff treating exposed patients should exercise standard precautions. WHO facilitates the provision of training placements at well-established poisons centres and, through its poisons centre network, it fosters links between poisons centres. Furthermore, the establishment and strengthening of poisons centres is one of the priority actions for governments to enhance health sector engagement in the Strategic Approach to International Chemicals Management.

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