



Unit I – Problem 4 – Clinical: Organophosphate Poisoning

- The exposure to organophosphates can be:
 - **Accidental:** such as inhaling insecticides.
 - **Suicidal.**
- Organophosphates can enter the body through the skin, by inhalation (characterized by rapid-absorption) or orally. They have a garlic-like smell.
- Signs or symptoms:

- They appear because organophosphates act as indirect cholinergic agonists leading to the accumulation of acetylcholine (by inhibiting the action of acetylcholine esterase).
- Therefore, the actions of parasympathetic nervous system will be activated in addition to some actions of the sympathetic system (such as sweating).

- **Muscarinic effects of organophosphate poisoning:**

DUMBELS	Presentation
D	Diaphoresis, Diarrhea
U	Urination
M	Muscle weakness, Miosis (تقلص حدقة العين)
B	Bradycardia, Bronchorrhea, Bronchospasm
E	Emesis
L	Lacrimation
S	Salivation

- **Nicotinic effects of organophosphate poisoning:**

- ✓ Muscle fasciculations.
- ✓ Cramping.
- ✓ Weakness.
- ✓ Diaphragmatic failure.

- **CNS effects of organophosphate poisoning:**

- ✓ Anxiety.
- ✓ Emotional lability.
- ✓ Restlessness.
- ✓ Confusion.
- ✓ Ataxia.
- ✓ Tremors.
- ✓ Seizures.
- ✓ Coma.

- **Diagnosis of organophosphate poisoning:**

- It is a clinical diagnosis but can be confirmed based on measurement of cholinesterase activity:
 - ✓ Plasma pseudo cholinesterase level.
 - ✓ RBC cholinesterase: correlates better with CNS acetylcholinesterase.
 - ✓ Monitoring serial levels: determine response to therapy.
- Chest x-ray shows: pulmonary edema.
- ECG: commonly shows sinus tachycardia but with excessive toxicity sinus bradycardia will occur.



- **Management of organophosphate poisoning:**
 - ABCs (Airway; Breathing; Circulation).
 - Education.
 - Reduce further absorption (by gastric lavage).
 - To give repeated doses of atropine (5-10 minutes) which will block muscarinic receptors until atropinization (relief of the symptoms). Notice that Atropine will not block nicotinic receptors thus pralidoxime must be given (but there are some limitations). Pralidoxime is not effective with aging and it cannot cross the blood-brain barrier (BBB).
- **With organophosphate poisoning, delayed toxicity might happen due to demyelination of nerves.**