Acetylcholinesterase Inhibitor Poisoning

Acetylcholinesterase inhibitor poisoning, also known as organophosphate toxicity and cholinergic overdose, is a syndrome of excess cholinergic activity after exposure to an acetylcholinesterase inhibitor, such as organophosphate-containing insecticides. These substances, including malathion and parathion, can irreversibly inhibit acetylcholinesterase. Normally, this enzyme breaks down the neurotransmitter acetylcholine, which is important for normal functioning of the parasympathetic nervous system. Organophosphates prevent acetylcholinesterase from working, however, leading to excess acetylcholine activity and a parasympathetic response. Atropine and pralidoxime may be used as antidotes. Clinical manifestations can be remembered with the mnemonic DUMBBELSS: diarrhea, urination, miosis, bronchospasm, bradycardia, emesis, lacrimation, salivation, and sweating. These signs and symptoms are a result of excess parasympathetic nervous system activity.



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DUMBBELSS
Dumb-bells
DUMBBELSS is a mnemonic to remember the symptoms seen in acetylcholinesterase inhibitor poisoning. These symptoms occur as a result of massive discharge of the parasympathetic nervous system.

Diarrhea
Toilet
Following early symptoms of hypersecretion, patients may experience diarrhea resulting from acute toxicity and stimulation of the GI tract.

Urination
Urinal
In severe cases, stimulation of the urinary tract by acetylcholinesterase inhibitors may cause incontinence.

Miosis
Mice-eyes
Pupillary constriction, or miosis, may be a result of acute toxicity.

Bronchospasm
Broccoli-spaceship
Bronchospasm is the primary cause of death in acetylcholinesterase poisoning, and can produce symptoms of coughing, wheezing, and pulmonary edema.

Bradycardia
Snail-heart
Bradycardia and hypotension may be a result of acute toxicity, especially in children.

Emesis
Vomit
Parasympathetic hyperactivity in the GI tract may result in emesis.

Lacrimation
Crying
Hypersecretion, including lacrimation, may be seen early on in acute poisoning following inhalation exposure.

Salivation
Drooling
Increased glandular secretions, such as salivation, may occur quickly following organophosphate exposure.

Sweating
Sweaty-sweatband
In organophosphate poisoning, increased glandular secretions, such as sweating, may occur.

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