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.

PLAY PICMONIC

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.