toxtidbits
the maryland poison center's monthly update. news. advances. information.
1-800-222-1222
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Cholinergic Toxidrome

The cholinergic toxidrome represents the acute phase of acetylcholinesterase (AChE) poisoning. An excessive build up of acetylcholine is due to the inhibition of AChE, the enzyme responsible for breaking down the neurotransmitter. The resulting clinical effects are due to the excess acetylcholine activating nicotinic and muscarinic receptors found in the CNS and periphery; specifically, neuromuscular junctions, sympathetic and parasympathetic nervous systems. Causative agents of AChE inhibition include medications such as the cholinesterase inhibitors physostigmine, neostigmine, donepezil and tacrine as well as organophosphate and carbamate pesticides and some mushroom species. Other agents include chemical weapons such as tabun, sarin, soman and VX.

A constellation of symptoms seen in patients presenting with the cholinergic toxidrome can be remembered easily with two mnemonics, SLUDGE and DUMBELS. The "Killer Bs," bronchorrhea and bronchospasm, are often the cause of death in patients with AChE poisoning. In addition, symptoms associated with excess acetylcholine at nicotinic receptors include mydriasis, tachycardia, weakness, hypertension and fasciculations. The mnemonic used to remember these symptoms is the days of the week, **MTWtHF**.

SLUDGE
Salivation
Lacrimation
Urination
Diaphoresis/diarrhea
Gastrointestinal distress
Emesis

DUMBELS
Diarrhea, **D**iaphoresis
Urination
Miosis
Bradycardia, **B**ronchorrhea, **B**ronchoconstriction
Emesis
Lacrimation
Salivation

Symptom onset, severity and response to treatment depend upon the offending agent, route of administration, and whether the agent irreversibly or reversibly binds to cholinesterase. Treatment of cholinesterase poisoning consists of supportive care (e.g. suction of oral secretions, intubation, mechanical ventilation, IV fluids), and the use of two antidotes, atropine and Pralidoxime (2-PAM). The use of atropine will result in alleviation of symptoms through central and peripheral reversal of acetylcholine excess at muscarinic sites, but will not treat the underlying cause of cholinesterase inhibition. 2-PAM reactivates cholinesterase and reverses the nicotinic effects caused by excess acetylcholine.

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DID YOU KNOW THAT… there is a smartphone app for easy access to the poison center?

POISON Help 1-800-222-1222

The American Association of Poison Control Centers recently released a "Poison Help" app for the iPhone. Users can click on the Poison Help logo to connect to the local poison center. This free app is available by searching for "Poison Help" in iTunes, or by going to http://itunes.apple.com/us/app/poison-center-help/id426623359?mt=8 . Poison Help apps for Blackberry, Droid and Windows 7 smartphones will be available soon. We encourage everyone to program their cell phone with the poison center number: 800-222-1222!

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