

ANS - TOXICITIES

SOURCES OF CHOLINERGIC BLOCKERS

- Veterinary Medicines
 - Atropine, glycopyrrolate
 - Hyoscine, propantheline



- Plants
 - Belladonna, Datura,
 - Solanaceae (nightshades, potatoes)
 - Mushrooms (*Amanita panterina*)



ANS - TOXICITIES

SOURCES OF MUSCARINIC AGONISTS

- Veterinary Medicines
 - Pilocarpine, bethanecol

- Plants

- Fungal toxin in red, white & alsike clovers (toxin-slaframine)
- Mushrooms (*Amanita muscaria*)



ANS - TOXICITIES

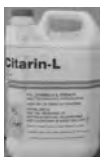
SOURCES OF CHOLINESTERASE INHIBITORS

- Veterinary Medicines
 - Physostigmine, neostigmine (NMB reversal)
- Plants
 - Blue-green algae [anatoxin-a(s)]
- Cholinesterase Inhibitors
 - Organophosphates
 - carbamates

ANS - TOXICITIES

SOURCES OF NICOTINIC AGONISTS

- Toxicants with Nicotinic Effects
 - Plants
 - Tobacco (*Nicotiana*)
 - Poison Hemlock (*Conium maculatum*)
 - Sophora, Laburnum
 - Chemicals
 - Levamisole (anthelmintic)



ANS - ORGANOPHOSPHORUS Toxicity

- SOURCES

- Insecticides
- Pesticides
- Dips
- Pour-ons
- Flea Collars
- Sprays
- Anthelmintics



ORGANOPHOSPHORUS Toxicity

- TOXICITY

- HIGHLY VARIABLE 100'S OF OP Compounds
- Rats
 - LD 50 ranges from <1 mg/kg to > 4 grams/kg
- Birds and Fish very sensitive

ORGANOPHOSPHORUS Toxicity

- MECHANISM OF ACTION:

- Inhibition of acetylcholinesterase at cholinergic receptors (IRREVERSIBLE when aged)
- Inhibition of acetylcholinesterase (RBCs)

ORGANOPHOSPHORUS Toxicity

- CLINICAL SIGNS (MUSCARINIC):

- SLUDGE
 - Salivation
 - Lacrimation
 - Urination
 - Defaecation
 - Dyspnoea
 - Emesis

ORGANOPHOSPHORUS
Toxicity

- CLINICAL SIGNS (MUSCARINIC):
 - sweating
 - brady or tachy cardia depending on adrenaline release
 - pinpoint pupils (usually)
 - nasal discharge

ORGANOPHOSPHORUS
Toxicity

- CLINICAL SIGNS (NICOTINIC)
 - Tremors
 - Weakness
 - Paralysis

ORGANOPHOSPHORUS Toxicity

- CLINICAL SIGNS (CNS):
 - Nervousness
 - Apprehension
 - Ataxia
 - Convulsions
 - Coma
 - Small animal: ± seizure, hyperactive, hyperreflexive
 - Large animal: rarely seizure, ± hyperactive

ORGANOPHOSPHORUS
Toxicity

- Muscarinic Signs: SLUDGE
- Nicotinic Signs: Muscle Tremors
- CNS: Anxiety, hyperactivity, clonic-tonic seizures

ORGANOPHOSPHORUS Toxicity

Intermediate Syndrome

- CATS and DOGS
- anorexia, diarrhoea, weakness,
- muscle tremors,
- abnormal posture and behaviour,
- clonic-tonic seizures

ORGANOPHOSPHORUS Induced Delayed Neuropathy OPIDN

Mechanism of Action

- Caused by inhibition of neuropathy target esterase (NTE)
 - Loss of myelin and axons in the spinal cord
- Known Substances Causing OPIDN:
∞ leptofos, fenitrothion, trichlorfon, trichloronat and others

ORGANOPHOSPHORUS Toxicity

- DIAGNOSIS
 - History
 - Garlic odour?
 - decreased acetylcholinesterase activity
 - Test dose of 0.02 mg/kg atropine

ORGANOPHOSPHORUS Toxicity

- TREATMENT:
 - DECONTAMINATE
(dermal vs oral exposure)
 - Atropine sulphate
 - Part given Intravenously,
 - the rest Subcutaneously
 - 0.25-1 mg/kg



ORGANOPHOSPHORUS Toxicity

- TREATMENT:
 - 2-PAM (Protopam chloride or aka pralidoxime chloride)
 - SUPPORTIVE CARE
 - Fluid therapy? Oxygen?
 - Seizure control-diazepam (Valium)



ORGANOPHOSPHORUS Toxicity Intermediate Syndrome

- TREATMENT:
 - 2-PAM (Protopam chloride or aka pralidoxime chloride)
 - SUPPORTIVE CARE



CARBAMATES

SOURCES:

- ∞ Carbaryl - insecticides
- ∞ Slug and Snail bait-MESUROL
 - ∞ LD₅₀ = 25 mg/kg



CARBAMATES

• MECHANISM OF ACTION

SAME AS OPs except reversible binding to acetylcholinesterase

CARBAMATES

- CLINICAL SIGNS:
 - Similar to Organophosphorus compounds

CARBAMATES

- TREATMENT
 - Similar to Organophosphorus compounds
EXCEPT DO NOT USE 2-PAM
 - 2-PAM is not necessary and may be harmful

ANS Toxicities

ORGANOPHOSPHATES DDx

- Amitraz
- Pyrethrins
- Cationic Surfactants e.g. benzalkonium chloride
- Garbage intoxication (endotoxins)

OPs and Carbamates

KEY POINTS

- ∞ SOURCES-numerous
- ∞ Do NOT accumulate (in fat) *
- ∞ RAPIDLY EXCRETED
- ∞ Comp Inhib ACETYLCHOLINESTERASE
- ∞ "AGING" OF OP-ENZYME complex

OPs and Carbamates

KEY POINTS

∞ POTENTIATION:

Phenothiazine tranquilizers (e.g. ACP)

30 day wait after exposed to OPs

Blocks acetylcholinesterase



OPs and Carbamates

KEY POINTS

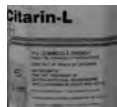
POTENTIATION:

Levamisole:

-nicotinic stimulation

Aminoglycosides:

-blocks acetylcholinesterase



OPs and Carbamates

KEY POINTS

∞ Muscarinic: SLUDGE + other clinical signs

∞ Nicotinic and CNS effects

∞ ATROPINE AND 2 - PAM (oxime)

(2-PAM is not necessary with carbamate poisoning)

OPIDN

∞ Cattle drenched with trichloronat

∞ Trichloronat - pasture insecticide

∞ OPIDN Onset 2-3 weeks after drenching