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):
  - SLUDDE
    - 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: SLUDDE
- 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:

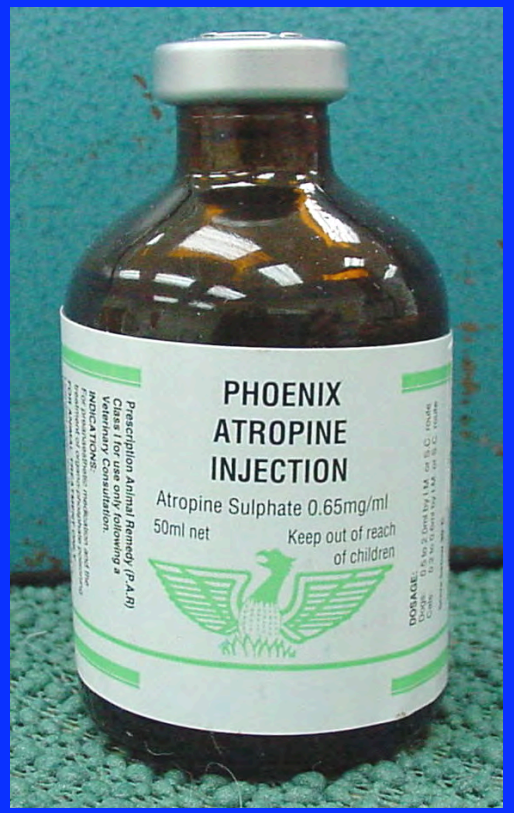
∞ leptofos, fenitrothion, trichlorfon, trichloronat and others

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)

pralidoxime

ORGANOPHOSPHORUS Toxicity Intermediate Syndrome

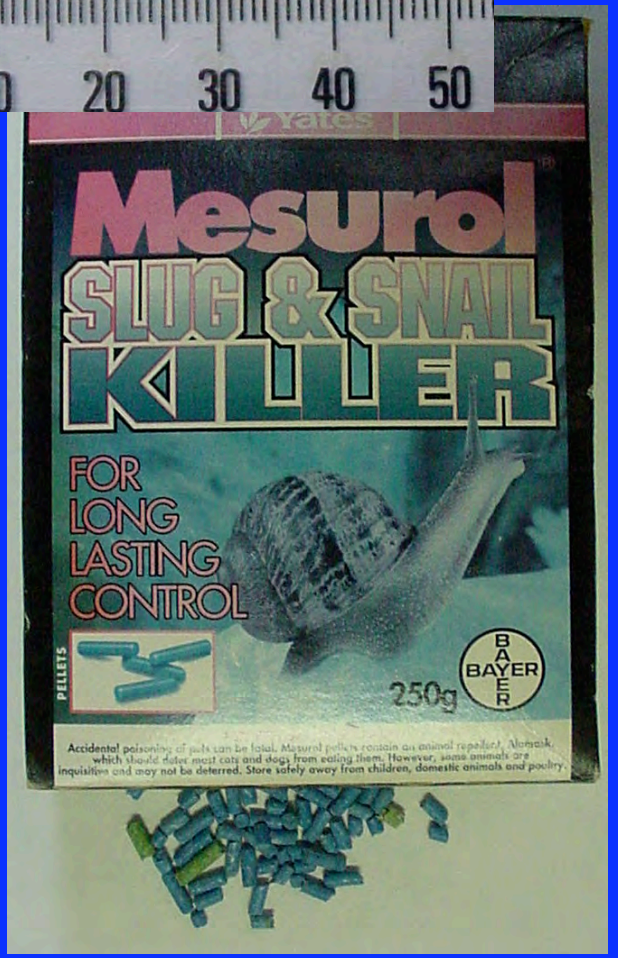
- TREATMENT:
  - 2-PAM (Protopam chloride or aka pralidoxime chloride)
  - SUPPORTIVE CARE

pralidoxime

CARBAMATES

SOURCES:

- Carbaryl - insecticides
- Slug and Snail bait-MESUROL
  - LD_{50} = 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:

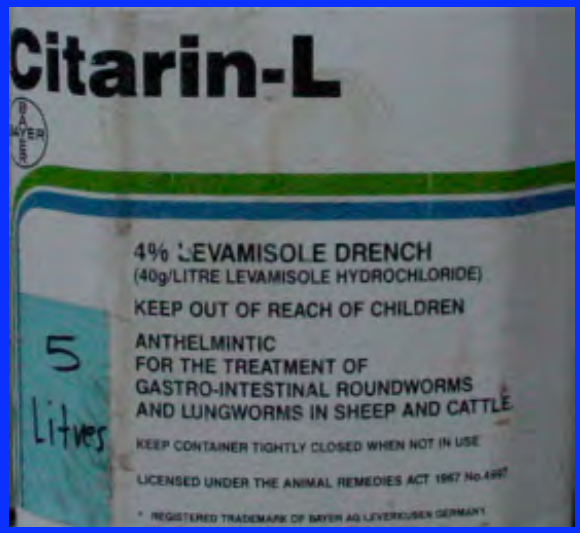
  Phenothiazine tranquilizers (e.g. ACP)

  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: SLUDDE + 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