

Problem Based Approach to CNS Toxicities

Excitation or Seizures

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CNS

SEIZURES, EXCITATION

Differential diagnoses:

- Sodium fluoroacetate Compound 1080
- Metaldehyde - slug & snail baits
- Lead (Mixed CNS effects)
- Pyrethrins & Pyrethroids (mixed CNS)
- Ryegrass staggers

CNS

SEIZURES, EXCITATION

Differential diagnoses:

- Salt poisoning (water deprivation/Na)
- Chocolate (Mixed CNS effects)
- Organochlorine insecticides (DDT)
- Strychnine
- Herbicides: MCPA and 2,4-D

CNS Excitation Toxicities

1080 (sodium monofluoroacetate)

Sources of 1080:

Pesticide to control possums and other pests

- Pelleted bait or
- Impregnated carrots
- dyed black or green
- poisoned carcasses



CNS Excitation Toxicities

1080 TOXICITY

TOXICITY:

- Extremely toxic
- < 1 mg/kg oral lethal dose for:
 - cats, dogs, rabbits, pigs
 - cattle, sheep, goats
 - horses

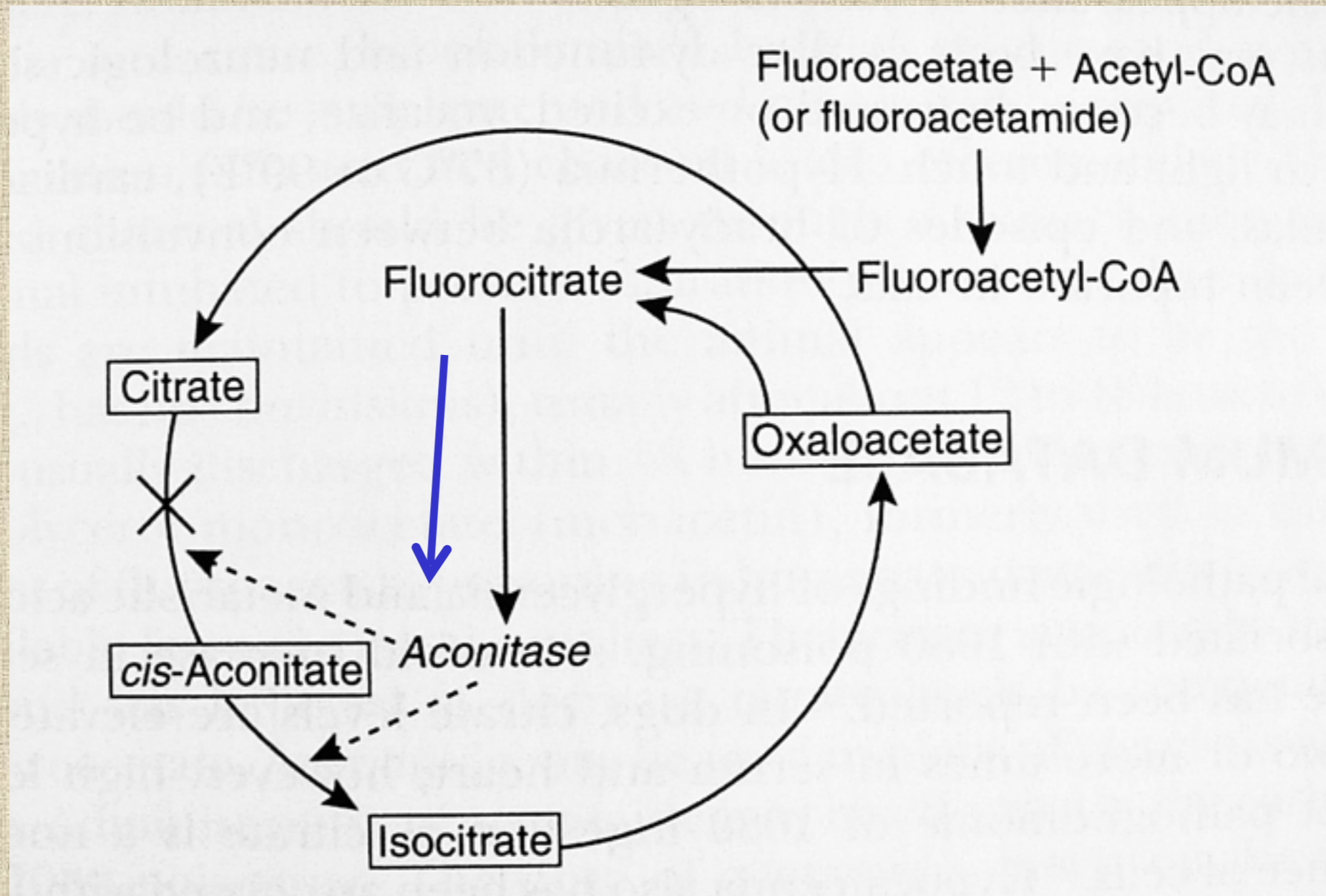


CNS Toxicities

COMPOUND 1080

Mechanism of Action: (classical theory)

Kreb's
Cycle
(TCA)



CNS Excitation Toxicities

COMPOUND 1080

Toxic effects are variable:

- Primates and herbivores
 - Primarily a Cardiac dysfunction
- Cats, sheep and pigs
 - Cardiac and nervous effects
- Carnivores (e.g. dogs)
 - Primarily nervous signs/effects

CNS Excitation Toxicities

COMPOUND 1080

Clinical Signs/effects in the dog:

- Vocalisation, Running
- Tetanic-like seizures
- Frequent defaecation, urination
- Metabolic Acidosis
- Hyperthermia
- ↑ Blood glucose, ↓ Calcium (ionised)



CNS Excitation Toxicities

COMPOUND 1080

Clinical Signs/effects in herbivores:

- Stagger, tremble
- Signs of gastrointestinal upset
- May resemble hypocalcaemia in dairy cattle
- Cardiac arrhythmias
- Stress or exercise precipitates death
- Terminal convulsions

CNS Excitation Toxicities

1080

Clinical Pathology:

- Hyperglycaemia (2 fold or greater)
- Hypocalcaemia (ionised calcium)
- Increased serum citrate
- Metabolic acidosis

CNS Excitation Toxicities

1080 TREATMENT:

- Decontaminate if no clinical signs
- Anticonvulsants (diazepam or barbiturates)
- Metabolic Acidosis
 - Sodium Bicarbonate (fluids)
- Acetamide (fluids) **NOTE!!!**
 - do not use with NaBicarb
- Supportive Care



CNS Excitation Toxicities

1080 Post mortem & Diagnosis:

- Non-specific changes
- Agonal heart changes
- Rapid onset of rigor mortis
- Analysis of stomach contents **
- History of exposure

CNS Excitation Toxicities

1080 Summary:

- Clinical signs for dogs - excitation
- Effects on herbivores - cardiac
- Metabolic acidosis - Sodium Bicarb
- Rapid onset of rigor mortis
- Clin Path changes (glucose, Calcium)
- Symptomatic care & acetamide?

CNS Excitation Toxicities

Metaldehyde

Sources of Metaldehyde:

- Slug or snail bait
- Pelleted mixture
 - dyed blue-green or
 - non-dyed pellets



CNS Excitation Toxicities

Metaldehyde

Toxicity of Metaldehyde:

- Dog: 200 mg/kg (but variable)
- Cattle, sheep: 200-300 mg/kg
- Bittering agent added to deter ingestion. It is not 100% effective in stopping ingestion in dogs



CNS Excitation Toxicities

Metalddehyde

Mechanism of Action:

- Unknown - only partly understood
- Affects CNS neurotransmitters
- Onset can be minutes after ingestion, but may be after 1-2 hours

CNS Excitation Toxicities

Metalddehyde

Clinical signs - dogs, cats:

- Anxiety, grimacing, restlessness
 - Dog-Grimace
- Depression
- Vomiting and diarrhoea
- Salivation
- Muscle tremors "shake and bake"
- Incoordination

CNS Excitation Toxicities

Metalddehyde

Clinical signs - dogs, cats:

- Blindness
- Metabolic Acidosis
- Excitation to narcosis
- Tachycardia, Tachypnoea
- Cats-nystagmus, convulsions stimulated
- Surviving animals may develop liver/renal disease

CNS Excitation Toxicities

Metalddehyde

Clinical signs - Herbivores:

- Ataxia, tremors
- Colic, diarrhoea
- Blindness
- sweating
- hyperthermia
- Tachycardia, Tachypnoea
- Salivation

CNS Excitation Toxicities

METALDEHYDE

Clinical Pathology

Metabolic Acidosis - check acid/base*

Probably not available in most practices.

In cases of moderate to severe toxicity:

Liver enzymes may increase

Renal tests (urea nitrogen, creatinine) increase

Diagnosis:

Submit frozen stomach contents (or vomit)

METALDEHYDE TREATMENT

- Decontamination <http://www.youtube.com/watch?v=lzY59qiUeyI>
- Metabolic Acidosis
(corrects itself when tremors are controlled)
- Symptomatic and Supportive Care
- Anticonvulsants (as needed)
 - Diazepam
 - Methocarbamol (Robaxin)**
 - Barbiturates

Monty messes with metaldehyde!



- Monty is a 20 kg Border Collie
- Owner discovers Monty has eaten snail bait
- Bait contains 15 g metaldehyde/kg product
- LD_{50} is 200 mg/kg BWt
- How much does Monty have to eat to get a lethal dose?