**Botulism**

**Classic case:** LIMP, flaccid, weak, down animal
- Recent change in feedstuffs (presence of animal and bird carcasses in food)
- Dead livestock
- Abrupt onset flaccid tetraparesis, dysphagia, tremors
- Clinical signs occur within 24-48 hours of ingestion

**Presentation:**
- **Horses and cattle** are very susceptible
- **Dogs, cats and pigs** are fairly resistant

All species:
- Short-strided gait
- Progressive symmetric tetraparesis/tetraplegia
- Flaccid tetraparesis
- **Poor to absent reflexes** (including palpebral)
- Normal sensation
- Respiratory paralysis is possible

Dog:
- Ophthalmoplegia, dysphagia, megaesophagus, dysphonia

"Shaker foals"
- 1-3 month old foals
- Repeated episodes of trembling
- Liquid appears at nares after sucking or drinking

Adult horses:
- May suddenly become less active and want to lie down
- Trembling due to weakness
- **If sternal recumbency, rests chin on ground for support**
- Mydriasis, urine retention, ileus
- Wet, paretic tongue, easily pulled from mouth
- Silent chewing action

Cattle:
- **Sternal recumbency with neck flexed to one side and head resting on thorax**
- Silent chewing action
- Very wet, paretic tongue, easily pulled from mouth

Chickens, waterfowl:
- "Limberneck"
- Flaccid paralysis of the legs, wings, neck, and eyelids
- In affected waterfowl, neck paralysis can lead to drowning

**Holstein with botulism**
Note the resemblance to milk fever ie: down, flaccid, staring at hinds
Holstein with botulism
Note limp tongue

DDX:
Dog
- Polyradiculoneuritis
- Acute fulminating myasthenia gravis
- Tick paralysis
- Polymyositis
- Snake envenomation (coral snake)
- Organophosphate toxicity
Horse
- Equine degenerative myelopathy
- Colic
- Rhabdomyolysis
Cattle
- Milk fever (hypocalcemia)
- Hypokalemic myopathy
Poultry/waterfowl
- Marek’s disease (poultry)
- Fowl cholera (waterfowl)
- Lead toxicity
- Chemical toxicity

Test of choice:
Definitive diagnosis is difficult
Antibody detection by ELISA (useful to monitor outbreaks, usually not individual cases) serum, feces, or vomit
Isolation of Clostridium botulinum in grain, silage, patient’s feces
Electromyography may be of benefit but is not definitive

Rx of choice:
Polyvalent antiserum – expensive!
Antibiotics for wound botulism is controversial - may release more toxin from killed bacteria
- Crystalline penicillin
- Metronidazole is alternative
- Avoid procaine penicillin, tetracyclines, aminoglycosides (will exacerbate effects on neuromuscular blockade)

Nursing care
- Hydration, Alimentation (stomach tube)
- Body waste elimination
- Comfort
- Avoid decubital ulcers
- O₂ supplementation and assisted ventilation in severe cases
Prognosis:

Varies: Poor to very good
Large animals that remain recumbent for more than 24 hours usually do not survive
In dogs, weakness can last 3-4 weeks before improvement occurs

Prevention:

In areas where shaker foal syndrome is common:
Clostridium botulinum type B toxoid given to mares in the last trimester

Pearls:

Usually herd outbreaks in cattle, but more often individual cases in horses, dogs and cats

3 forms of toxicity
- Ingested toxin
  - Preformed toxin in food
    - Contaminated decaying carcasses, vegetable matter
    - Maggots on contaminated carcasses, eaten by scavenging chickens
  - Massive waterfowl die-offs occur from flocks eating dead invertebrates in water containing decaying vegetation
- Toxicoinfectious botulism
  - Shaker foal
    - Clostridium botulinum produces toxin in foal’s small intestine
- Wound botulism
  - Clostridium botulinum grows and produces toxin from within a wound

Eight types of botulinum toxin
- Dogs and cats usually affected by botulinum toxin C
- Horses usually affected by botulinum toxins B and C
- Cattle usually affected by botulinum toxins C and D
- Poultry and waterfowl usually type C (infrequently A and E)
Images worth a look

Clostridial disease images in cattle, including botulism, National Animal Disease Information Service (UK)

Six pictures of the flaccid paralysis of botulism (mink, ducks, cattle), from the Center for Food Security and Public Health website

Duck with classic “limberneck”, flaccid paralysis, Merck Veterinary Manual

Video clip of a horse with botulism: from, Veterinary Neuroanatomy & Clinical Neurology, de Lahunta & Glass, Cornell University


My Notes: