West Nile Virus (WNV)

Classic case: Horse w/ fever, listlessness, acute onset hind limb ataxia and weakness

Presentation: Usually summer months

Horse:
- Fever
- Listlessness, hyper excitability
- Hind limb ataxia and weakness
- Hyperesthesia
- Generalized muscle fasciculations
- Drooping lip, tongue weakness
- Grinding teeth
- Blindness
- A diffuse encephalomyelitis

Ruminants:
- Usually a single animal affected
- Neurologic signs, death within 1-2 days

Geese:
- Recumbency
- Leg and wing paralysis
- Reluctant or unable to move when disturbed
- Incoordination – flip over while attempting to stand
- Torticollis and opisthotonos

Dogs and cats:
- Often asymptomatic
- Rarely
  - Fever, depression
  - Muscle weakness
  - Seizures, paralysis
  - Myocarditis
- Consider WNV in animals w/ neurologic and cardiac signs

Wildlife:
- Birds- Commonly found dead
- Gray squirrels
  - Lethargy, paw biting, vocalization
  - Ataxia, circling, encephalitis, myocarditis

DDX:
- Rabies, EHV-1, EPM, EEE, WEE, VEE, botulism

WNV infection is one of the equine encephalitis-causing viruses (EEE, VEE, WEE, WNV).
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Test(s) of choice:

- **Mammals**
  - CSF – mononuclear pleocytosis and elevated protein
  - IgM capture ELISA on serum and CSF
  - Microtiter virus neutralization test on serum and CSF
  - Plaque neutralization test on serum and CSF
  - RT-PCR for virus detection on CNS tissue is gold standard

- **Geese**
  - Tissues for isolating virus – brain, spleen, kidneys
    - Homogenates are inoculated into the brain of newborn mice, embryonated eggs or Vero and mosquito cell line cultures
  - RT-PCR can also be performed

  

**REPORTABLE DISEASE**

**Rx of choice:**

Supportive care
- Hyperesthesia - NSAIDs
- Muscle fasciculations – ataractics
- Slinging

**Prognosis:**

**Horse:**
- Guarded – about 60% survive,
- But only 30% recover fully after 6 months
- May relapse
- **Better prognosis if**
  - > five years of age
  - Can stand with little weakness
  - History of previous vaccination

**Geese:** Mortality is 20-60%

**Prevention:**

- Mosquito protection and control
- Vaccination esp. in endemic areas

Electron micrograph of West Nile Virus isolated from brain tissue from a crow found in New York. Image courtesy CDC

Brain of a flamingo with West Nile Virus encephalitis note the hemorrhages. Image courtesy CDC / Tracey McNamara, DVM, DACVP
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**Pearls:**
- Multiple *cases of acute deaths in birds* can herald an outbreak in other hosts
- WNV – Flavivirus
- Reservoir – wild birds
- Vector – mosquitoes – *esp Culex spp*, although it has been isolated from ticks

- **Chickens** are can be infected naturally and develop antibodies
  - but *do not show clinical signs*.
  - Chickens are often used as **sentinels to detect the presence of WNV**

- 1st human and animal cases in US seen in 1999, New York City, (discovered in 1937, Uganda)
  - **WNV first detected by Bronx zoo veterinarian**, Dr. Tracey McNamara
  - 2012 a bad year for WNV in US -Over 1590 human cases, highest recorded since 1999
  - Human cases divided into “neuro-invasive” (bad) and “non-neuro-invasive”

**Refs:**
- A Practical Guide to Canine and Feline Neurology, Dewey, 2nd ed. p 178,
- Vet Neuroanatomy & Clinical Neurology, de Lahunta & Glass, 3rd ed. p 126, 289, 304, 341-342, 425, 491,
- Large Animal Neurology, Mayhew, 2nd ed. p243-245,
- Merck Vet Manual, 10th ed (online): West Nile Virus in poultry, Equine encephalomyelitis

**My Notes:**