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*the new name for the ILPH*

# Infectious diseases of horses

A clinical approach: Neurological disease

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# Neurological examination

- A thorough neurological examination can **localise** the level of the **lesion/s**.
- This will help differentiate between **non-infectious and infectious** causes.
  - Eg History of trauma, acute onset ataxia: neuro exam isolates to lesion of cervical region. Suggests non-infectious cause.



# What contagious neurological diseases can affect my horse?

## •Virus:

- West Nile Disease
- Equine Herpes Virus 1
- Rabies
- Borna virus
- (EEE/WEE/VEE)

## •Bacterial:

- Tetanus
- Botulism

## •Protozoal:

- (Equine Protozal Myeloencephalitis)



# West Nile virus

- **Zoonotic!:** but low risk from horse
- **Methods of transmission:**
  - Blood seeking mosquitoes
  - Oral
  - Contaminated blood transfusion
  - Vertical (placenta, milk)
- Higher occurrence during warm weather



Mosquito borne



Birds



Mosquitos

Dead end hosts



Horses



Humans





# What clinical signs will I see?

- Subclinical and clinical forms; variable severity
- **Systemic** abnormalities:
  - Pyrexia, anorexia, depression
- **Neurological** abnormalities: often sudden + progressive
  - Muscle fasciculations
  - Behavioural changes (hyperexcitability, aggression)
  - Sudden sleep-like activity (cataplexy)
  - Periods of collapse and non responsiveness
  - Gait abnormalities (stilted, slow)
  - Ataxia, paresis: may be asymmetric
  - Intermittent cranial nerve abnormalities
  - Recumbency and death



# So how do I know it is West Nile Virus?

- No pathognomonic signs!
- Clinical signs
- Confirmed disease in region
- Serological testing: IgM capture ELISA
  - Sensitivity 80%
  - Specificity 100%



# Can you treat West Nile Virus?

- About **30%** progress to complete paralysis of one or more limbs: euthanasia
- Many horses improve within **3-7 days** (1-6months for full recovery; may have residual weakness/ataxia)
- **Treatment:**
  - Flunixin meglumine 1.1 mg/kg BID
  - If recumbent: dexamethasone 0.05-0.1mg/kg IV q 24hrs; mannitol;
  - Tranquilisation/sedation: detomidine, acepromazine
- **Vaccine** available



# What about Rabies?

- **Zoonotic!!**
- Method of transmission: **bites**
- Clinical signs: **Diverse!**

- Poor performance, colic, bizarre behaviours

- **Cranial nerve signs:** Dysphagia, inability to drink

- **Cerebral:**

- Progressive depression: **dumb** form
- Aggression: **furious** form eg self mutilation
- Pruritis, seizures, blindness, head pressing.

- **Spinal cord:**

- Lameness, shifting weight, knuckling
- Constipation, dribbling urine, flaccid tail.



# How to diagnose Rabies?

- If you are **suspicious** of Rabies
  - Animal **bite** on horse
  - **Clinical signs** suggestive
- Only definitive diagnosis is **post mortem!**
- Animal should be **euthanased!**
  - No effective treatment
  - Public health risk: handle with protective gear
- Prevention: **vaccination + wildlife control**



# Tetanus

- *Clostridium tetani*: Anaerobic, gram positive
- **Spastic** paralysis
- **Ubiquitous** soil inhabitant: infectious but not contagious
- **Vaccinate!**
- Wounds, surgical sites
- Exotoxins: **Tetanospasmin**- binds irreversibly to presynaptic inhibitory interneurons



# How can you diagnosis tetanus?

## • Presumptive

## • History

- Usually 7-10 days after wound/ surgery
- Sporadic cases

## • Clinical signs:

### Mild

- Prolapse of nictitans
- Extended head
- Anxious expression
- Trismus

### Moderate: as mild plus

- Dysphagia
- Hyperresponsiveness
- Muscle spasms
- 'Sawhorse' stance

### Severe: as moderate plus

- Lateral recumbency
- Severe, frequent spasms
- Respiratory difficulties
- Cardiovascular instability



# Can you treat tetanus?

- Mild, moderate or severe?
- **Treatment plan:**

## **1. Management:**

- Quiet, dark, nursing if recumbent
- IV fluids + nutrition (NGT) if unable to eat/drink

## **3. Eliminate C. Tetani and unbound toxin**

- Open wound, flush out, debride, infiltrate TAT
- Antibiotic: Metronidazole 20-30mg/kg BID PO 3-5 days.
- Give 10,000-50,000 IU TAT IV 3-5 days.

## **2. Analgesia:**

- Flunixin meglumine 1.1mg/kg.
- Opioids if req.

## **4. Sedation & muscle relaxation:**

- ACP 0.02-0.1 mg/kg IV/IM q 6-12hrs
- Diazepam 0.1-0.2mg/kg (CARE respiratory depressant)



# Prevention is better than cure...

- **Prognosis: 50% mortality!**
  - Recumbency within 24-48hr is poor indicator
- **Give Tetanus Anti Toxin** to the unvaccinated animal if it has a wound or needs surgery.
- **Preventable** through vaccination!
  - Tetanus toxoid: 2 doses 3-6 weeks apart; yearly boosters
  - Vaccinate broodmares 4-6wks before foaling
  - If mare vaccinated vaccinate foal from 6 months.
  - If mare unvaccinated; vaccinated foal from 3months.



# Botulism

- *Clostridium botulinum*: gram positive, anaerobic
- Exotoxin: prevent presynaptic release of acetylcholine at neuromuscular junction causing flaccid paralysis.
- Contaminated forage, wound contamination
- Diagnosis: history, clinical signs, toxin detection (mouse inoculation)
- Treat: botulinum antitoxin, nursing care
- Clinical signs:

- Dysphagia
- Flaccid paralysis
- Decreased eyelid, tongue, tail tone

- Progressive tetraplegia
- Diminished pupillary reactivity
- Death (respiratory paralysis)



# Borna Virus

- Subclinical reservoir: **persistent** CNS infection
- **Shed** in nasal/ lacrimal secretions, urine
- **Laboratory diagnosis:** serum/CSF; IFA/ELISA
- Clinical signs:

- Peracute, acute, subacute  
**meningoencephalitis**

- **Variable:** dependent on area of brain inflammation

- Behaviour change, depression, ataxia, head tilt, sham eating, yawning, head pressing...

- Variable incubation

- Death 1-4wks after onset in 80% of animals



# Equine Herpes Virus 1

- Diagnosis (see respiratory lecture)
- **Pyrexia** often only warning sign
- Clinical signs: **variable**, dependent on lesion location. eg
  - Ataxia, paresis, paralysis
  - Bladder dysfunction
  - Head tilt