Overview of Horse and Donkey Diseases in West Africa

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Different types of diseases

**Arthropod – Borne Diseases**

- *Culicoides* (midges): - African Horse Sickness (EHS)
  - Equine Encephalosis (EE)
- *Mosquitoes*: Alphavirus, Equine Encephalitis in Senegal
- *Tsetse Flies* – biting flies: Trypanosomes

**Tick-Borne Diseases**

- Piroplasmosis
Different types of diseases

**Virus Diseases**
- Generalised diseases including Central Nervous System involvement

- African Horse Sickness ++ 9 serotypes attenuated live vaccine
- Equine Virus Arteritis + 1 serotype attenuated live vaccine
- Equine Encephalosis + several NONE
- Infectious Anaemia + 1 serotype NONE used
- Rabies + 1 serotype inactivated

**Respiratory diseases**
- Adenovirus Pneumonia + unknown inactivated + Live
- Rhinopneumonitis (EHV4) +++ inactivated
- Equine INFLUENZA Virus ++ 2 inactivated
- Rhinovirus + 3 None
- Equine Herpes virus 2 and 5 ++ unknown None
Different types of diseases

- **Virus Diseases**

- **Enteric diseases**
  - Rota virus  +++  None
  - Torovirus  +  1  None

- **Reproduction Diseases**
  - EHV1 (equine abortion)  +++  Inactivated + Live
  - Equine arteritis  +++  Attenuated live vaccine

- **Skin Diseases:**
  - Equine Papillomatosis  ++  several  None
Different types of diseases

- **Bacterial diseases**

- Many

- Tetanus (*Clostridium tetani*)
Equine trypanosomiasis

Disease caused by Trypanosomes and transmitted by biting flies: *T.b.evansi* and *T.vivax*

or Tsetse flies: *T.vivax, T.congolense, T.b.brucei*
# Equine trypanosomiasis

<table>
<thead>
<tr>
<th>Type species</th>
<th>Cattle</th>
<th>Goats Sheep</th>
<th>Pigs</th>
<th>Horses</th>
<th>Donkeys</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>T. brucei</em></td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+++</td>
<td>++</td>
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<tr>
<td><em>T. evansi</em></td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>+++</td>
<td>++</td>
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<tr>
<td><em>T. equiperdum</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td><em>T. congoense</em></td>
<td>+++</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><em>T. vivax</em></td>
<td>+++</td>
<td>++</td>
<td>-</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>

Reservoirs !!!
Equine trypanosomiasis

- Very often mixed infections:
  - If *T. brucei* and *T. evansi*: no problem because they can be treated with the same drug
  - But in case of *T. evansi or T. brucei* + *T. congoense and/or T. vivax*: Problems because you have to treat with two different drugs
Equine trypanosomiasis

**Epidemiology and Diagnosis** in Donkeys will be treated by Andrew TRAWFORD

**Treatment and Chimioprophylaxis**

- **Phenanthridinium**: Isometamidium and Homidium
- **Aromatic amidines**: diminazene di-aceturate
- **Quinoline pyrimidine**: Quinapyramine sulphate
- **Melarsomine**
Equine trypanosomiasis

Curative and Prophylactic:
- **ISOMETAMIDIIUM** (prophylactic up to 3-4 months) (IV 0,25MG/Kg)
- **HOMIDIUM** (prophylactic up to 6-7 weeks)
  - chloride: can be dissolved in cold water
  - bromide: can be dissolved only in warm water
    - toxic (Bromide is a heavy metal)

Same family: resistance against one, also resistance against the other

Good efficacy against *T. congolense, T.vivax*

*Not against T.evansi and T.brucel*
Equine trypanosomiasis

**Curative treatments**

**DIMINAZENE di-aceturate**: only TREATMENT
- 3.5 mg /Kg Bwth: *T. congolense*, *T. vivax*
- 7.0 mg/Kg Bwth: *T. brucei*, *T. evansi*

At 7.0 mg/Kg Bwth Diminazene is toxic  =>  Nervous signs

Diminazene di-aceturate is also active against Piroplasmosis (higher dosis)

**Quinapyramine sulphate**
- Lot of resistance (created very fast, 6 months after first treatment)
- **Toxic** (animals have to rest 4-6 hours before)
- In weak animals divide the dose in two, with 4 to 6 hours interval
- Efficacy against *T. congolense*, *T. vivax*, *T. brucei and T. evansi*

**MELARSOMINE**
- Very Safe
- Very good efficacy against *T. brucei, T. evansi and T. equiperdum*
Equine trypanosomiasis

**Causes of apparent drug resistance, lack of efficacy**

- Underdosage
- Incorrected calculated dose volume
  - Incorrect injection technique – short needles
  - Not sterile / abscessation
  - Early withdrawal of the needle
  - Leak back of product from injection site

**QUALITY OF TRYPANOCIDAL DRUGS USED!!!!**

- Avoid stress
  - Malnutrition
  - Lactation
  - Working and trekking
  - Intercurrent diseases (Immunodepression)

=> Relapse and/or New Infection

**REAL RESISTANCE**

- Reduce tsetse numbers and trypanosome challenges (avoid areas with lot of tsetse flies and biting flies and use insecticidal drugs)
Equine Piroplasmosis

- Tick-Borne Disease
- Caused by *Babesia equi* and *Babesia caballi*
- Clinical symptoms – fever ( > 40°C)
  - anorexia
  - progressive anaemia
  - icterus (yellow mucous membranes)
  - pregnant mares may abort
  - **urine**: dark yellow, orange or brown
  - Tachycardia
  - general weakness
  - sometimes light oedematous swelling of the limbs
    (but NOT as Tryp’s, AHS and helminth infestation)
  - Abortion, neonatal death (icterus) after colostrum intake

- Vector: Ticks (*Rhipicephalus*, *Hyaloma*, *Boophilus*)

- Different forms: peracute: found dead or moribund
  acute
  subacute
  chronic: inappetance => weight loss
  poor performances
Equine Piroplasmosis

**Diagnosis**
- Clinical examination
- Examination of Blood smear
- CF (complement fixation test)

**CONTROL**
- **Diminazene di-aceturate** (at high doses, up to 11 mg/Kg Bwth, **TOXIC for Horses and Donkeys**)
- **IMIDOCARB** 2 mg/Kg Bwth (*Carbesia*) 4 weeks of protection
  Repeated doses (2 to 4) may be required for both drugs to sterilise the animals
- **Tetracycline**: 2 or more days at 5.5 mg/Kg Bwth

**AVOID TICKS ON HORSES and DONKEYS !!!!!!!**
Equine Viral Diseases

- **Equine Rhinopneumonitis (EHV 4)**
  - Young animals
  - Fever and anorexia
  - Serous to mucopurulent discharge
  - Conjunctivitis
  - => secondary bacterial infection: **Pneumonia**

- **Equine Abortion virus (EHV1 and AHV3)**
  - Most important cause of **abortion** in mares and donkeys
    - without any other **clinical sign**
  - 6 to 11 months of gestation
  - Horses and donkeys may abort months or years after primary infection

- **EHV infections are followed by lifelong, latent infection**
- **EHV1 and EHV4 sometimes associated with neurological signs, ataxia, paralysis fore and hind limbs**

- **Prevention**: vaccination with inactivated (killed) vaccine
Equine Viral Arteritis

- One serotype: BUCYRUS strain
- In horses and donkeys (reservoir)

**Means of transmission:**
- Respiratory route by the acutely infected animal
- By venereal route: infected stallion (persistent infected)

**Clinical signs:** from none to abortion and fatal in very young foals
- But also possible: fever, depression, anorexia, oedema, nasal discharge, pneumonia.

Most recover completely without symptomatic treatment

**Diagnosis:** virus isolation

**Control:** vaccination live and inactivated vaccines
RABIES Virus Infection

- Transmitted by infected dogs, jackals, sometimes also cattle (kudu), cats, and wild animals as foxes and bats.
- Incubation after a bite is between two up to six weeks.
- Always fatal outcome in non-vaccinated animals.
Clinical Course

Three overlapping phases:

- **Prodromal phase** (marked change in behaviour)
- **Acute neurologic or « furious » phase**
- **Paralytic or « dumb » phase**

All three phases to death is a matter of 4 to 8 days after the onset of clinical signs
Rabies in equine and donkeys

Clinical Course

• **Prodomal phase**
  
  May last for 2 – 3 days characterised by a **marked change in behaviour**
  - Animals may appear ***anxious***, uneasy and irritable and increased sensitivity to noise and light
  - Sullen animals may become more alert, restless and friendly, and more friendly ones may become aggressive and attack without provocation, or become more depressed and withdrawn, hiding in dark places
  - during this phase there may be a slight pyrexia
  - self-mutilation at the site of the bite
  - pica

• **Neurologic or « furious » phase**
  - animals become **increasingly nervous, irritable and vicious, attack and bite**
  - become **more and more aggressive and agitated and often biting at any object**
  - show far-off look in the eyes
  - **muscle tremors, flacidity or incoordination usually develop**
  - eventually (as in humans) ***spasm and paralysis*** of muscles of deglutition
    
    => difficulty in swallowing and drooling and frothing saliva
  - animals want to drink but can not (in rabid humans => hydrophobia)
Rabies
Clinical Course

Paralytic or « Dumb » phase
- Muscular incoordination and convulsions gradually lead to generalised paralysis, => coma and death
- During this phase inability to swallow may cause excessive drooling or foaming at the mouth
- In horses rabies can produce colics (with heavy pain) and excitement, aggressive behaviour (attack with biting and kicking)
- horses may assume a sitting-dog posture

Inability to swallow may lead owners and Veterinarians into thinking it is choking from a swallowed foreign body

Saliva of horses with Rabies contains lot of rabies virus: DANGER FOR HUMAN BEINGS and for Other HORSES and DONKEYS
Rabid Horse
Rabies in Equine and Donkeys

**Control**
Through Vaccination

Inactivated vaccine (=killed vaccine)

**Protocol** The vaccination schedule depends first on the horse age:

1/ **Over 6 months**: once and annual booster

2/ **less than 6 months**, two situations:
   - **From vaccinated mares**: 1 injection from 4 months of age,
   - **From unvaccinated mares**: 1 injection from 2 months of age

In the two groups, an additional injection **one month later is necessary**, than one annual booster injection.
TETANUS

- Tetanus is a **non-contagious**, almost **invariably fatal neurointoxication** in horses and donkeys.
- The disease is caused by *Clostridium tetani* and usually develops after **DEEP, PENETRATING WOUNDS** (nails in hoof, castration, bites, permanent tooth eruptions, umbilical stump of neonates...)
- In the damaged tissue the bacteria will develop (anaerobic) and produce its potent neurotoxin, **TETANOSPASMIN** which causes the **rigidity** and **muscle spasms**.
- Tetanus occurs wherever animals are farmed.
- **Horses and human** beings are the **most sensitive** to the effects of toxins.
- Spores of *C. tetani* are present in **soil**, **dust** and the **faeces** of most herbivores, so also in horse manure (*C. tetani* is part of the normal gut flora).
TETANUS

Clinical signs

**Incubation period**: from 3 days to one or three weeks

(exceptionnally several months or even several years)

Initially a general increase in **stiffness** of the muscles followed very quickly by **tetanic spasms** of all muscles, in particular when external stimuli (handling, noise) or even sights.

- Prolapse of the third eyelid
- Flared nostrils
- Colic, retention of urine, sweating, dyspnoea, **staring eyes**

Total **stiffness** of the hind legs

Death usually follows within 12 to 72 hours
TETANUS

Diagnosis
- Clinical signs

Control
wound: - local disinfection
- local infiltration of Penicillin G
- Hyperimmune serum

VACCINATION: with tetanus toxoid
- First vaccination: 2 times at 3 to 4 weeks interval
- Annual booster: 1 injection

Foals are protected by colostrum of mares which are vaccinated up to the age of 10 weeks
Tetanus and Rabies

For ALL persons working with horses and donkeys directly or indirectly, regular vaccination against Rabies and Tetanus is a MUST, because the risk of being COTAMINATED with these two VERY DANGEROUS and FATAL Diseases is VERY HIGH.
Thank you very much for your attention