

Equine Infectious Anemia

Dr. Kaushal Kumar

**Assistant Professor & Head
Department of Veterinary Pathology
Bihar Veterinary College
Bihar Animal Sciences University, Patna**





Outline of Presentation



Introduction

The Organism

Epidemiology

Transmission

Pathogenesis

Zoonotic Importance

Diagnosis





Introduction

EIA first detected in U.S in **1888**

EIAV testing utilizing the Coggins test began in **1972**



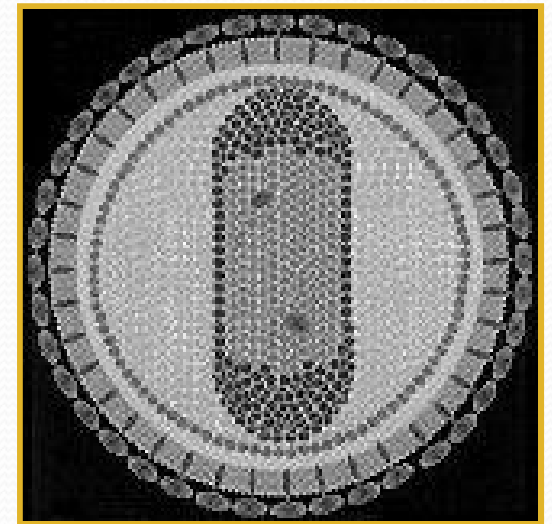
Synonyms: *Swamp Fever, Mountain Fever, Slow Fever, Equine Malarial Fever, Coggins Disease*



The Organism

Equine infectious anemia(EIA) virus

- Family **Retroviridae**
- Genus **Lentivirus**



The virus is close to Human Immunodeficiency Virus



Species Affected



All members of Equidae family are affected

✓ Clinical disease occurs in horses & ponies



✓ Donkeys may be asymptomatic and are less severely affected





Epidemiology



Found nearly worldwide

The virus (*EIAV*) is endemic in the Americas, parts of Europe, the Middle and Far East, Russia & South Africa
May be absent from Iceland, Japan Newzeland & U.S.

EIA is often highest in areas that are low-lying, swampy and humid hence the alternative name, swamp fever.





Morbidity & Mortality



- Infection rate varies**
 - Geographic region (humid, swampy)
- Seroprevalence**
 - Up to 70% on endemic farms
- Morbidity and mortality affected by:**
 - Virus strain and dose
 - Health of the animal
- Infections often go unnoticed**

Note: Deaths are otherwise uncommon in naturally infected horses



Transmission-Primary



Mechanical transmission

Mouthparts of biting insects or blood sucking insects

Horse flies, stable flies, deer flies

Virus survives upto 4 Hr in vectors

Fly behavior enhances transmission

Bites painful

Horses react

Fly feeding interrupted

Fly resumes feeding on same animal or nearby host

Infectious blood transferred to new host



Horse Fly



Transmission-Others



Fomites

- ✓ Needles
- ✓ Surgical instruments
- ✓ Floats

Other minor route

- ✓ *In utero*
- ✓ Via milk
- ✓ Venereal
- ✓ Aerosol



Mares can transmit the disease to their foals via the placenta.



Pathogenesis



- Infection is considered primarily **blood borne**,
- Virus is found **free in the plasma or cell associated**,
E.g., monocytes and macrophages of infected animals.
- Clinical signs associated with infection of macrophages and the **release of** pro-inflammatory mediators or cytokines, TNF , IL-1, IL-6, and transforming growth factor β .
- Response **together with suppression** of platelet production are believed to be the factors responsible for **the thrombocytopenia**
- *In addition, immune responses play a major role in the pathogenesis.*



Stages of EIA



- **Acute: Disease at full-force.**

Symptoms include high fever, anemia (due to the breakdown of red blood cells), weakness, swelling of the lower abdomen and legs, weak pulse, and irregular heartbeat. The horse may die suddenly.

- **Subacute: A slower, less severe progression of the disease.**

Symptoms include recurrent fever, weight loss, an enlarged spleen, anemia, and swelling of the lower chest, abdominal wall and legs.

- **Chronic: The horse tires easily and is unsuitable for work.**

The horse may have a recurrent fever and anemia,



Sign & Symptoms



- ❖ **Clinical signs often nonspecific**
 - ✓ **Fever**, weakness, depression
 - ✓ Jaundice, tachypnea, tachycardia
 - ✓ Ventral pitting edema
 - ✓ Petechiae, epistaxis and or melena
 - ✓ Anemia (chronically infected animals)
- ❖ **Most recover and become carriers**
 - ✓ Infections may become symptomatic again during times of stress



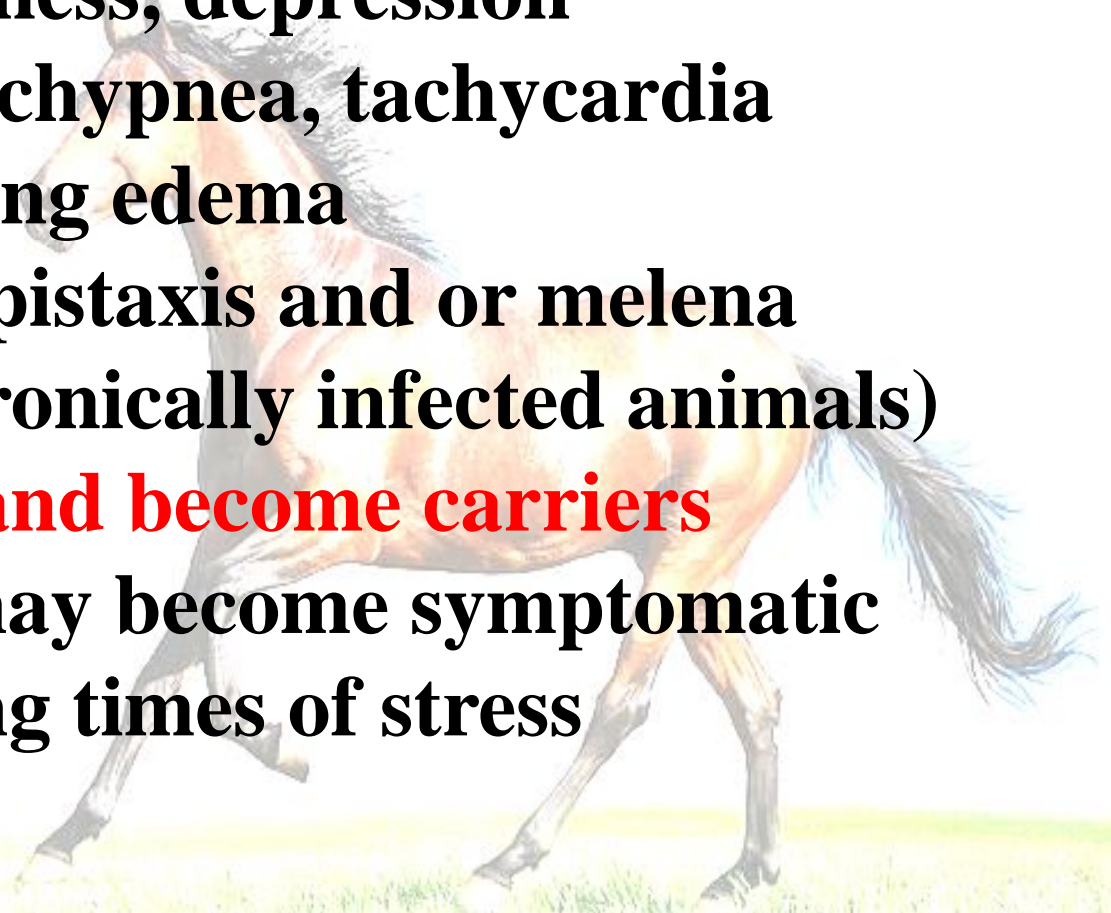
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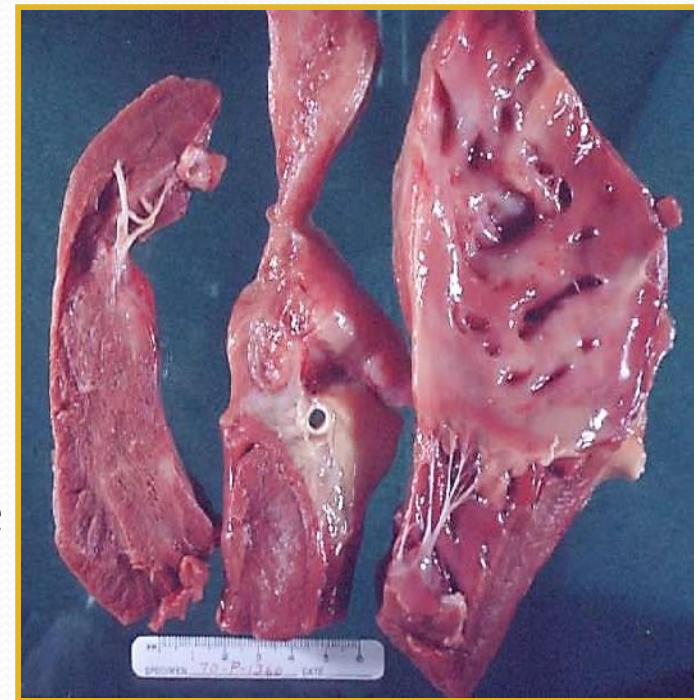




Necropsy Lesion



- Pale mucous membranes
- Edema-limbs& ventral abdominal wall
- Enlarged spleen, liver, lymph nodes
- Cardiac muscles are flabby and friable
- Haemorrhages (Petechiae) in the liver, spleen, kidneys, on serous membranes and in the mucosa of the intestines
- ❖ Usually no lesions in chronic carriers





Zoonotic Importance



❖ *Equine infectious anemia is not a risk for people*





Diagnosis

The Coggins test (agar immunodiffusion) :

A sensitive diagnostic test for equine infectious anemia developed by Dr. Leroy Coggins in the 1970s.

RT-PCR

**Good for foals with maternal antibodies
(up to 6-8 months of age)**

Used to confirm serological tests

