

Family: Theileridae

By: Dr. Sanku

Members of the family are Round, Ovoid, Rod like, Irregular form. Usually found in lymphocyte, histiocyte and erythrocyte. Schizont stage in lymphocyte, later found on erythrocyte without further development.

They do not produce pigment and transmitted by Ixodid tick. They occur in cattle, sheep, goat and other ruminant. Schizogony occurs in cytoplasm of lymphocyte and finally enter in to RBC.

Genus: *Theileria*

Organism multiplies by schizogony in lymphocyte and finally invades in to erythrocyte.

Species

- Theileria parva*: East coast Fever or bovine tropical theleriosis- Highly pathogenic
- Theileria lawrenci*: Corridor diseases- Highly pathogenic
- Theileria annulata*: Bovine Tropical theleriosis- Moderately pathogenic
- Theileria mutans*: Benign bovine Theileriosis-Mildly pathogenic

Theileria parva: Distribution is limited because it is transmitted by *Rhipicephalus appendiculatus*. . Found in central East and Southern Africa. Besides exotic and cross-bred animals, young indigenous calves are also susceptible and suffer severely. Indigenous cattle generally donot show clinical signs, but remain carriers and aconstant source of infection to susceptible animals. Three host tick and stage 2 stage transmissions occur. It is also transmitted by *R evertsi*, *Hyaloma anatolicum*, *Hyaloma dromedarii*.

Morphology: In RBC- it is mainly rod shaped, however, round, oval, comma; ring shape may also occur with Romanowsky stain, they show blue cytoplasm with red chromatin granules. Several parasites may occur in a single RBC without multiplying. Several organisms may occur in RBC with no evidence of multiplication. Active multiplying form occurs in cytoplasm of lymphocyte, occasionally cytoplasm of endothelial cell of lymph gland and spleen. These are schizont stage known as “Koch’s Blue Bodies” circular or irregular in shape. The KBB is about 8micrometer in diameter, but they may vary from 2 to 12 micrometer or more.

With Romanowsky stain they show blue cytoplasm and varied numbers of chromatin granules (8nos). Two form of schizont are recognised.

- A. Macroschizont: Those who contain large chromatin granules are referred as macroschizont and produce macromerozoite.
- B. Microschizont: Contain smaller chromatin granules and produce micromerozoites. The latter invade the red blood cells and may represent sexual stages of parasite

As the tick *R appendiculatus* attach in the ear, lymphnode of neck and prescapular region showed ist developmental stage of parasite.

Asexual reproduction stage occurred in bovine. However, the sexual reproduction occurs in tick. Lysis of erythrocytic stage occur and merozoites are liberated and differentiated into sexual stage.

1st visible stage after infection occurs in the local lymphnode on 5-8 days of infection.

Pathogenesis of East coast Fever:

1. Serious diseases with high mortality in susceptible stock characterised by lymphoid hyperplasia followed by exhaustion of lymphoid tissue.
2. Imported stock, mortality may reach to 20-100.
3. Zebu (*Bos indicus*) has high level of resistance and in enzootic areas, Calf hood mortality of 5-10% where as zebu introduces from a non enzootic area, mortality is very high.
4. Incubation period is 10-25 days. Acute form is very common lasting 10-25 days. Acute form is very common lasting 10-23 days.
5. Disease commence with fever, temperature increases to 40-41.7⁰C which maintained until death or recovery.

A few days after onset of fever temperature rises to 40-41.7⁰C, which maintained until death or recovery.

A few days after onset of fever, animal cease to eat, swelling of superficial lymphnode. There may be nasal discharge, lacrimation, swelling of eyelids and ear. Heart beat is rapid, diarrhoea with blood and mucus and marked emaciation. Lung edema occurs and probably causing death of animals in acute stage.

Post mortem finding in acute cases is marked enlargement of spleen and liver showing yellowish brown in colour, friable and shows degeneration. Lymphnode are markedly swollen and hyperaemic, Kidney shows haemorrhagic or greenish white infarct. Lung congested and oedematous. Fluid in the thorax, pericardium, underneath the kidneys capsule. ulceration of abomasum and small and large intestine occurs. Ulcer consists of central necrotic area surrounded by a haemorrhagic zone.

Subacute form of East coast fever disease frequently occurs in calves. Clinical signs are similar to acute form, but not pronounced recovery is common than acute.

“Turning sickness” is associated with *T parva*, *T mutans*.

Affected animals make circling movements.

Abduction of hind limbs,

On post mortem, increase CSF, Extravassation of blood in various area of cortex,

Localised area of necrosis in brain

T parva is not transmitted through blood inoculation to other animals. But readily transmissible by spleen or lymphnode suspension from infected animals.

Immunity:

Solid, specific, doesnot depends on pre immunity. Immunity is not influenced by splenectomy.

Diagnosis:

- Demonstration of organism schizont in superficial lymphnode/spleen aspirate.
- Erythrocytic form may difficult to see at early infection
- IFA
- IHA

Treatment:

Oxytertracycline and Chlor tetracycline will arrest macro and micro schizont form of infection. May given prior or at the time of infection.

Buparvaquone is drug of choice for *Theiliria*

Vaccination: Rakshavac-T

Theileria annulata is transmitted by *Hyalomma* tick

- Moderate in cattle
- Mild in buffaloes
- Most commonly occurs in round or ring form

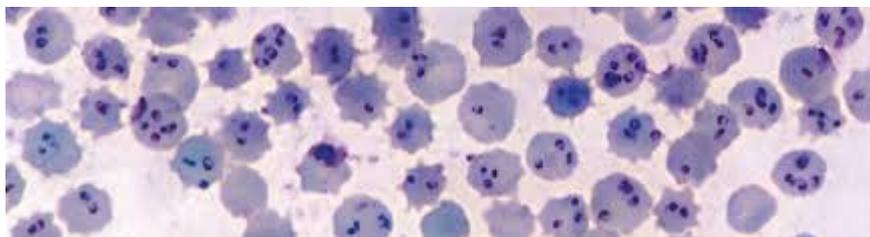
Pathogenesis:

Disease entity may be

- Acute : occurs in all breed as well as all age of cattle, buffalo, and Zebra.
- Subacute
- Chronic

Incubation period 9-25 days. In acute form disease persists 3-4 days or may be prolong as 20days. Body temperature raises 40-50⁰C. animal shows depression, lacrimation, moist nasal discharge, swelling of superficial lymphnodes. On post mortem – enlarged spleen/Liver, Infarction on kidneys, Oedema of lungs, swelling of lymphnodes, icteric mucosa and often petechiation. Abomassum and small intestine are swollen redden, with a characteristic **ulcer** of 2-12 mm in diameter with a zone of inflammation. Bore punctured ulcer. Necrotic infarct of brain is also observed.

Immunity: Recovery from *T.annulata* infection leads to the development of premunity, infection can be transmitted from such animal by blood inoculation. There is no cross immunity between *T. annulata*, *T.mutans* or *T.parva*.



T.annulata

