

## **Theilerioses, East coast fever (ECF) tropical theileriosis or (Mediterranean coast fever)**

Theileriasis are a group of tickborne diseases caused by *Theileria* spp. A large number of *Theileria* spp are found in domestic and wild animals in tick-infested areas of the Old World. The most important species affecting cattle are *T parva* and *T annulata*, which cause widespread death in tropical and subtropical areas of the Old World. *T lestoquardi* (formerly *T hirci*), *T luwenshuni*, and *T uilenbergi* are important causes of mortality in sheep.

### **East Coast Fever**

East Coast fever, an acute disease of cattle, is usually characterized by high fever, swelling of the lymph nodes, dyspnea, and high mortality. Caused by *Theileria parva*, and transmitted by the tick vector *Rhipicephalus appendiculatus*.

### **Transmission**

- The African buffalo is an important wildlife reservoir of *T parva*, but infection is asymptomatic in buffalo.
- *T parva* transmitted by ticks from either cattle or buffalo cause severe disease in cattle.
- Hence, buffalo *T parva* are maintained as a separate population.
- *T parva* is usually highly pathogenic, causing high levels of mortality, although some less pathogenic isolates have been identified.

### **Pathogenesis**

*T parva* sporozoites are injected into cattle by infected **vector ticks** follows incubation phase of 5–10 days. Subsequently, the number of parasitized cells increases rapidly throughout the lymphoid system, and from about day 14 onward, cells undergoing merogony are observed. This is associated with widespread lymphocytolysis, marked lymphoid depletion, and leukopenia. Piroplasms in RBCs infected by the resultant merozoites assume various forms, but typically they are small and rod-shaped or oval.

### **Clinical Findings**

1. Clinical signs vary according to the level of challenge, and they range from inapparent or mild to severe and fatal.
2. Typically, fever occurs 7–10 days after parasites are introduced by feeding ticks, continues throughout the course of infection, and may be > (41°C).
3. Lymph node swelling becomes pronounced and generalized.
4. Petechiae and ecchymoses may be found on the conjunctiva and oral mucous membranes.
5. Anorexia develops, and the animal rapidly loses condition; lacrimation and nasal discharge may occur.
6. Hemorrhagic diarrhea may be seen in the late stages.

7. Terminally, dyspnea is common.
8. Just before death, a sharp decrease in body temperature is usual, and pulmonary exudate pours from the nostrils.
9. Death usually occurs 18–24 days after infection.
10. Most recovered or immunized animals remain carriers of the infection.

### Lesions

- The most striking postmortem lesions are lymph node enlargement and massive pulmonary edema and hyperemia.
- Hemorrhages are common on the serosal and mucosal surfaces of many organs, sometimes together with obvious areas of necrosis in the lymph nodes and thymus.
- At necropsy, schizonts may be found in impression smears from most internal organs.
- Anemia is not a major diagnostic sign (as it is in babesiosis) because there is minimal division of the parasites in RBCs, and thus no massive destruction of them.

### Diagnosis

#### 1. Clinical signs

#### 2. Laboratory examination .

- a. Lymphoblasts in Giemsa-stained smears of needle aspirates from lymph nodes contain multinuclear schizonts
- b. Polymerase chain reaction (PCR) tests and DNA probes are sometimes used to detect and identify *Theileria* species
- c. Antibodies to *T.* can be detected with an enzyme-linked immunosorbent assay (ELISA), IFA test

### Differential diagnosis

1. Heartwater
2. Trypanosomosis
3. Babesiosis
4. Anaplasmosis
5. Malignant catarrhal fever
6. Contagious bovine pleuropneumoniae

### Treatment

- Treatment with **parvaquone** and its derivative **buparvaquone** is highly effective when administered in the early stages of clinical disease but is less effective in the advanced stages, in which there is extensive destruction of lymphoid and hematopoietic tissues.
- A single dose of long-acting oxytetracycline can be given at same time; although oxytetracycline has little therapeutic effect when administered after development of disease, it inhibits development of the parasite when given at the outset of infection.

- **Supportive therapy such as** anti-inflammatory drugs, tick removal, iron preparations, dextrose, vitamins (B complex), purgatives, and fluid replacements, may be necessary in severe cases of theileriosis.

### Control

- Ticks eradication.
- Immunization of cattle against *T parva* using an infection-and-treatment procedure is practical and continues to gain acceptance in some regions.
- Cattle should be immunized 3–4 week before being allowed on infected pasture.
- Attenuated strains containing the schizont stage of *T parva* and *T annulata* produced by serial passage of such cultures as a live vaccines used in several countries

### Ovine and Caprine Theileriasis

- ✓ *Theileria lestoquardi* (formerly *T hirci*) causes a disease in sheep and goats similar to that produced in cattle by *T annulata*, with which it is closely related.
- ✓ The limited available epidemiologic data indicate that *T lestoquardi* has a more restricted geographic distribution than that of *T annulata*, being particularly prevalent in the Middle East and northeast Africa.
- ✓ Mortality can approach 100%. Morbidity and mortality rates of up to 65% (*T luwenshuni*) and 75% (*T uilenbergi*) have been seen in susceptible animals introduced into endemic areas.
- ✓ Affected animals show sustained fever and anemia.

### Equine Theileriasis

*Babesia equi* was reclassified as *T equi* in 1998, based on DNA analysis and other biologic data.