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Popular Article

Bovine Theileriosis: A Threat to Cattle Productivity and Health

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Abstract

Theileriosis also known as East Coast Fever, an economically important haemoprotozoan disease of dairy cattle and buffaloes in African countries, many parts of Asian subcontinent & middle east countries. The protozoa affect all the age groups including exotic and crossbred cattle. This is mainly characterized by high rise of temperature, anemia, swelling of lymph nodes. The ever-increasing prevalence of this disease now considered a headache to animal owners as well as field veterinarians with various non-specific clinical signs, posing difficulty for early diagnosis. This article might be helpful in refreshing the knowledge about Theileriosis related to clinical signs, methods of diagnosis, and the strategies to control and prevent the disease.

Introduction

Theileriosis, is a tick borne haemoprotozoan disease affecting mostly dairy industry, caused by *Theileria annulata, T. parva* and *T. orientalis*. It was first reported in India by Lingard in 1905. They differ from Babesia in that their schizogony takes place in the lymphocytes and monocytes of the blood, lymphnodes and spleen. The parasite remains in erythrocytic form and Schizont form. Tick like Hyalomma and Rhipicephalus spp. Belonging to the genera Ixodid helping in transmisssion of the disease. In India, it was estimated a huge amount of annual economic loss approxiamately ≈ 384 million USD (Krishnamoorthy *et al*., 2021). Hence, it is very pertinent to know the details of disease for wide awareness among the farming community to curb the menace of this disease.

Aetiology

Species that mainly affect cattle and buffalo is *Theileria annulata* and *T.parva*, out of which *T. annulata* is the most widespread and pathogenic one. The acute disease affects every breed and of all ages of cattle and buffaloes. Course of the disease is usually 3 to 4 days but may last up to 20 days. It causes a highly fatal disease which greatly reduces the economic importance of cattle of every age.

Susceptible animals are infected through the bite of Ixidid tick vectors mainly Hyalomma and Rhipicephalous spp. As in rainy season, there is more exposure to the infected ticks, so, the new born are most likely to get affected in rainy season and early summer.

Clinical signs

The clinical symptoms of the disease mainly observed are enlargement of regional superficial lymph nodes, high fever up to about 40 – 41.5^{o}C, tachycardia and tachypnoea, petechial hemorrhages on conjunctiva. Tensed eyeball with watery lacrimation, weakness, prostration, anorexia, restlessness are also observed. Animal is observed with rough and dry hair-coat. In later stages, there is development of anemia with coloured urine. Sometimes still birth and abortions are also witnessed (Gebrekidan *et al.,* 2019). Urticarial lesions with haemoglobinuria may also be observed. Cerebral form of theileria has also been noticed in some animals.

Pathology

The main post mortem lesion is Punched out ulcers in abomasum, increase in size of the of the spleen, lymphnodes and liver. Enlarging of lymph nodes and peyer's patches may sometimes edematous and hemorrhagic. The serous sacs are filled with fluid and there may be pulmonary edema, which may be hemorrhagic. Microscopically, the lymph nodes show depletion and necrotic foci in the follicles and cortical region. Lymphocytes are reduced in number due to their destruction and hence the reticulum is more conspicuous. The interstitial spaces are filled with remnants of lymphocytes. In kidney and liver, perivascular proliferation of lymphoid tissue may be found. There may be nodular accumulation of cells that causes atrophy of the renal tubules.

Diagnosis

The disease under field conditions is diagnosed by demonstration of schizonts in material obtained from superficial lymph nodes or spleen (Ziam *et al.*, 2020), prominent clinical signs and necropsy lesions, by blood smears with presence of intraerythrocytic piroplasms and Koch's blue bodies (KBB). Koch's blue bodies are demonstrated in the peripheral blood or lymph nodes. Its also found in the brain smears in case of cerebral theileriosis. Anaemia considered as a consistent finding in advanced as well as severe infections. Absolute monocytosis may be seen. Severe leucopenia occurs with total white cell counts as low as 2000/cu mm while haemoglobin, PCV and TEC, in the affected animals is significantly decreased.

Treatment

Control measures for bovine tropical theileriosis include prophylaxis and chemotherapy. Tissue culture vaccines based on the principle of passages of schizontal stages. In Odisha, the commonly used vaccine for theileria include the Rakshavac T recommended for cattle those are 2 months and above.

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It is an effective and safe vaccine developed for susceptible cattle in field condition. Buparvaquone @2.5mg/kg bwt (Butalex) can be safely used in endemic areas without any side effect. Oxytetracyclines and Tetracyclines in the incubation period reduce the clinical reactions by decreasing the rate of parasitaemia. But these drugs have little reaction when clinical signs are set. Tetracycline group of drugs like Chlortetracycline @16mg/kg body wt for 8 days, Oxytetracycline, Rolitectracycline @4mg/kg body weight intramuscularly for 3 days arrest the development of the schizonts. Quinozolines like halofuginone affects the early stages. Halofuginone and menoctone have been shown to be active against *T.annulata*. Halofuginone lactate @1.2mg/kg bwt and Berenil has also been seen giving good results.

Prevention and Control

Control of tick population is necessary. Systemic application of insecticide and rotational grazing may minimize the tick population. Exotic and crossbred cows should be kept in tick free shed as far as possible. Implementation of good animal husbandry practices, rotational grazing, alternate grazing, regular monitoring, use of insecticide and acaricide and pasture management is considered as a strategic planning to check the spread of disease. Anti-tick sprays or tick dips should be done to remove ticks from the animal's body. Any new animal brought to the farm should be quarantined. Immediate culling of the affected animal must be done to prevent spread of the disease.

Conclusion

Bovine theileriosis immensely affects cattle worldwide. It has significant economic implication resulting in loss of productivity of the animal and profit of the farmer. However, proper prevention and control measure if taken can reduce the incidence to a lesser extent. Farmers should also be properly educated on vaccination and clinical signs so treat the animal as early as possible. Routine blood examination may be advised for early screening of the disease. Significant progress has been made for the treatment but still further research needs to be done on the effective diagnostic tools and immunization of the disease.

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