

Bovine Babesiosis in India: An Update

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Abstract

Bovine babesiosis is also known as cattle tick fever, red water disease or piroplasmosis in cattle. Bovine babesiosis is one of the major haemoprotozoal disease of cattle in India. The losses caused by this disease to the livestock industry is highly devastating. In India the estimated annual losses due to Bovine babesiosis is found to be about ≈57.2 Million USD. This disease is of great economic importance in India and have always challenged the livability of crossbreed and exotic cattle.

Aetiology

Bovine babesiosis is an economic important tick-borne haemoprotozoan disease caused by *Babesia bigemina*, *Babesia bovis* and *Babesia divergens*. The occurrence of bovine babesiosis is common in tropical climates because of the highest distribution of its arthropod vectors in those areas. In India, the most prevalent ones are *B. bigemina* and *B. bovis*. The pathogenicity of *B. bovis* is more than that of *B. bigemina*. *Babesia* organism is an intracellular parasite which invade the erythrocytes of the affected host. Incubation period for this disease is 1-2 weeks.

Transmission

The mode of transmission of this disease is through the bite of tick vectors. The major tick vectors for *B. bigemina* & *B. bovis* are *Rhipicephalus microplus* and *Rhipicephalus annulatus* while *Ixodes ricinus* is the major arthropod vector for *B. divergens*. The transmission of *B. bovis* occurs through the larval stages of one host *Rhipicephalus spp.* ticks while the nymphal and adult stages of the same tick spp. transmit *B. bigemina*. *Babesia* organisms can also be transmitted during transfusion, through small amount of blood on reused needles, surgical instruments and fomites contaminated with infected blood and mechanically by biting flies. Transplacental transmission in calves is also reported.

Immunity

In nature young animals are resistant while older animals are susceptible to this disease. The natural resistance of the young calves to infection usually disappears at 9-12 months of age. Cattle who get infected once can develop a long-lasting immunity against reinfection but the immunity is species specific. This means if the cattle are infected with *B. bovis* then immunity is acquired against *B. bovis* only.

Clinical signs

This includes high fever (40-41 degree Celsius), weakness and depression. Animal is anorexic and there is fall in milk yield. Sometimes nervous signs like ataxia and incoordination may be seen. Animal produces dark-red or brown colored urine. Mucus membrane appears pale and there is increase in respiratory & heart rate. There is profuse diarrhea followed by marked constipation. In advanced stage there is anemia, hemoglobinuria & jaundice which is followed by the death of the animal.

Postmortem lesions

During postmortem investigation the mucus membrane may appear icteric or pale, blood shows a watery consistency, icteric appearance of subcutaneous tissue, abdominal fat & omentum is observed. Liver appears swollen with an orange-brown or paler coloration. Consistency of bile appear thick and granular. Spleen appears enlarged, dark and friable. There might be presence of dark red or brown colored urine in urinary

bladder with minute haemorrhages may be observed in brain.

Diagnosis

This disease can be diagnosed through history of tick infestation and clinical signs, light microscopic examination of blood smear, in vitro culture method, ELISA and IFAT.

Treatment

Drug of choice for babesiosis is Diminazene Aceturate (Berenil) @ 3.5mg per Kg B.Wt. S/C or I/M (for cattle) for two days. This drug is only used for therapeutic purpose. There is no prophylactic value. Other available drugs include Imidocarb dipropionate. It has both therapeutic and prophylactic value. Therapeutic dose for cattle @ 1.2 mg/ Kg BWt., single dose, I/M or S/C.

Prevention and control

The first step towards the prevention and control of Bovine babesiosis is the elimination of tick vectors by the use of acaricides (Amitraz, Cypermethrin, Ivermectin etc.) and repellants. Acaricide resistance by the ticks is a rising problem now. So repetitive use of same acaricide should be avoided. Reducing the exposure time of cattle to ticks by the practice of rotational grazing is advised. Regular screening of cattle for any type of tick infestation should be done. Use of chemoprophylaxis in cattle such as Imidocarb dipropionate @ 3mg/Kg Body Wt. I/M or S/C. Single injection gives protection for >1 month. Special care to be taken while the application of syringe needles and surgical instruments. Always properly dispose the syringe needle after use and never forget to disinfect the surgical instruments before use in field conditions. Bovine babesiosis can also be controlled through vaccination. Live vaccine is practiced by the inoculation of the infected blood, to control the subsequent clinical reaction with babesicidal drug such as Diminazine.

Conclusion

Bovine babesiosis is considered to be a very dangerous haemoprotozoal disease for the cattle in India. In order to prevent these huge economic losses to the farmers of India, veterinarians and livestock producers must work together to prevent the occurrence of this disease in cattle. Since haemoprotozoan diseases cannot be fully eradicated, focus must be directed towards its proper prevention and control. Hence further research is needed to develop more effective vaccines, diagnostic tools and treatment options to mitigate the impact of haemoprotozoal diseases on bovine health in India.

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