



Theileriosis in Large Animals of Rajasthan: Prevalence, Clinical Impact and Control

Maisar Ahmad Mir¹, Athar Nabi Sheikh², *Tahir Manzoor³,
Farhan Bashir⁴ and Arif Ahmad Najar⁵

¹Assistant Professor, Dept. of Veterinary Parasitology, SGVC, TU, Rajasthan, India

² Assistant Professor, Dept. of Veterinary Medicine, SGVC, TU, Rajasthan, India

³MVSc., Dept. of LPM, RAJUVAS, Bikaner, Rajasthan, India

⁴MVSc, Dept. of Veterinary Medicine, SKUAST- K, J&K, India

⁵Assistant Professor, Dept. of VAHE, SGVC, Tanta University, Rajasthan, India

*Corresponding Author's email: tahirmanzoor0228@gmail.com

Theileriosis is an important tick-borne protozoan disease affecting cattle and buffaloes and causing considerable concern for livestock health and dairy productivity. In Rajasthan, where livestock production takes place under diverse arid, semi-arid and irrigated agroclimatic conditions, tick infestation and haemoprotozoan diseases are important veterinary health concerns. Bovine tropical theileriosis is primarily caused by *Theileria annulata*, which infects white blood cells and red blood cells. Clinical manifestations include fever, enlargement of superficial lymph nodes, anaemia, weakness, reduced milk production and, in severe cases, death. Studies from western Rajasthan have documented substantial exposure to *T. annulata*, while investigations in Bikaner have confirmed infection in clinically suspected cattle calves. Early diagnosis, systematic tick control, good farm management and veterinary supervision are essential for reducing disease-associated losses.

Keywords: Theileriosis, *Theileria annulata*, cattle, buffaloes, Rajasthan, tick-borne disease.

Introduction

Livestock farming is an important component of the rural economy of Rajasthan, providing milk, manure, employment and financial support to farming families. Cattle and buffaloes contribute substantially to dairy production, but their productivity can be affected by parasitic diseases. Among these, theileriosis is an important tick-borne infection requiring attention from livestock owners and veterinary professionals. Theileriosis is caused by protozoan parasites belonging to the genus *Theileria*. In cattle, tropical theileriosis is mainly associated with *T. annulata*, which is transmitted by infected ticks, particularly ticks of the genus *Hyalomma*. The parasite develops in host cells and may cause severe illness, especially in susceptible or newly introduced cattle. Other *Theileria* species, including *T. orientalis*, are also recognised in bovines, and their epidemiology differs from that of tropical theileriosis.

Prevalence and regional importance in Rajasthan

Regional studies indicate that theileriosis exposure is widespread among cattle in parts of Rajasthan. Ram *et al.* (2006) investigated bovine tropical theileriosis in arid and semi-arid northwestern India using the indirect fluorescent antibody test. In western Rajasthan, 401 cattle were examined: 66% showed antibodies against *T. annulata*, comprising 42% with moderate and 24% with high antibody levels. These findings indicate considerable exposure to the parasite in the surveyed cattle population. However, seropositivity reflects previous or ongoing exposure and should not be interpreted as the percentage of animals suffering from active clinical disease.

Goyal *et al.* (2018) examined 100 cattle calves presented to the Teaching Veterinary Clinical Complex in Bikaner, Rajasthan. *T. annulata* was detected in 7% of animals by Giemsa-stained blood smear examination and in 3% by lymph-node aspirate smear examination. Since these animals were presented to a veterinary hospital, the results represent hospital-based findings rather than prevalence among all cattle in Bikaner or Rajasthan. Gurjar *et al.* (2020) investigated haemoprotozoan infections in cattle of southern Rajasthan. Among 323 cattle examined, 137 (42.41%) had haemoprotozoan infections, including mixed infections. *Theileria* species were detected in 0.61% of the animals as a single infection, while mixed infections involving *Theileria* and other haemoparasites were also reported. These findings highlight the importance of considering mixed infections during the investigation of bovine haemoprotozoan diseases. The results of these studies should be interpreted according to the population sampled, diagnostic methods and geographical coverage. They do not provide a single statewide prevalence estimate for all cattle and buffaloes of Rajasthan.

Clinical signs and economic importance

Affected animals may develop a high temperature, loss of appetite, depression, enlargement of superficial lymph nodes, pale mucous membranes and progressive weakness. Anaemia can develop as a consequence of infection and associated pathological changes. Severely affected cattle may experience respiratory distress, reduced body condition and, in some cases, death. Milk yield and reproductive performance may also be adversely affected during illness and recovery. The severity of disease depends on factors such as parasite species, the animal's age and immune status, previous exposure, breed susceptibility and the presence of other infections. Animals that recover may require time to regain normal production. In addition, expenditure on diagnosis, treatment, tick control and supportive care can increase the financial burden on livestock farmers.

Diagnosis and treatment

Clinical signs alone cannot reliably confirm theileriosis. Veterinary diagnosis may involve examination of Giemsa-stained blood smears for intraerythrocytic piroplasms and lymph-node aspirates for schizont stages. Molecular methods such as polymerase chain reaction (PCR) can improve detection and help distinguish *Theileria* species. Serological tests are useful for epidemiological investigations, although antibody positivity does not necessarily indicate active clinical disease. Treatment should be prescribed by a qualified veterinarian according to the suspected or confirmed parasite, severity of illness and condition of the animal. Specific antiprotozoal treatment, fluid therapy and other supportive measures may be required. Early veterinary attention is particularly important in animals with persistent fever, marked lymph-node enlargement, severe anaemia or rapid deterioration.

Prevention and control

Effective control requires an integrated approach:

1. **Tick management:** Use veterinary-approved acaricides according to label directions, with appropriate attention to application, safety and resistance management.
2. **Farm hygiene:** Maintain clean housing, manage vegetation around animal enclosures and inspect animals regularly for ticks.
3. **Early detection:** Seek veterinary examination when animals develop fever, enlarged lymph nodes, reduced appetite or a sudden fall in milk yield.
4. **Animal movement and quarantine:** Examine newly purchased or introduced cattle and follow veterinary advice before mixing them with the resident herd.
5. **Herd monitoring:** Maintain records of clinical cases, laboratory results, treatment, tick infestation and seasonal disease patterns.
6. **Responsible treatment:** Avoid indiscriminate drug use and follow veterinary guidance regarding treatment, withdrawal periods and follow-up examinations.

Conclusion

Theileriosis is an important tick-borne disease affecting bovine health and dairy productivity in Rajasthan. Regional studies from western Rajasthan, Bikaner and southern Rajasthan demonstrate exposure to *T. annulata* and the presence of haemoprotozoan infections in cattle. However, differences in sampling and diagnostic approaches prevent direct comparison of all reported percentages. Wider surveillance covering cattle and buffaloes across different agroclimatic zones is needed to establish contemporary, representative prevalence estimates. Timely diagnosis, appropriate treatment and sustainable tick control can help protect livestock health and support the livelihoods of Rajasthan's dairy farmers.

References

1. Ram R, Gupta SK, Sangwan AK, Nichani AK. (2006). Sero-prevalence of bovine tropical theileriosis in arid and semi-arid regions of north west India. *Journal of Veterinary Parasitology*, 20(2):191–192.
2. Goyal P, Chahar A, Tanwar RK, Fakhruddin, Shringi BN. (2018). Hospital-prevalence of *Theileria annulata* infection in cattle-calves determined by blood smear and lymph node aspirate smear examination in Bikaner, Rajasthan. *International Journal of Current Microbiology and Applied Sciences*, 7(6):877–884. doi: 10.20546/ijcmas.2018.706.103 .
3. Gurjar VS, Khatoon S, Singh R. (2020). Studies on prevalence of haemoprotozoa in cattle of southern Rajasthan. *Ruminant Science*, 9(2):267–274. Article link .
4. Krishnamoorthy P, Akshata LG, Jacob SS, Suresh KP, Roy P. (2021). Theileriosis prevalence status in cattle and buffaloes in India established by systematic review and meta-analysis. *The Indian Journal of Animal Sciences*, 91(4):269–279. doi: 10.56093/ijans.v91i4.114331 .
5. Raj MR, Vatsya S, Kumar RR. (2019). Prevalence of bovine tropical theileriosis in sub-Himalayan region of northern India. *The Indian Journal of Animal Sciences*, 89(7):728–731. doi: 10.56093/ijans.v89i7.92015 . Article link .
6. Nene V, Morrison WI. (2016). Approaches to vaccination against *Theileria parva* and *Theileria annulata*. *Parasite Immunology*, 38(12):724–734. doi: 10.1111/pim.12388 .
7. Narladkar BW. (2018). Projected economic losses due to vector and vector-borne parasitic diseases in livestock of India and its significance in implementing the concept of integrated practices for vector management. *Veterinary World*, 11:151–160. doi: 10.14202/vetworld.2018.151-160