



ISSN: 2456-2912

VET 2024; SP-9(3): 211-213

© 2024 VET

www.veterinarypaper.com

Received: 01-02-2024

Accepted: 04-03-2024

Tamilam TV

Department of Veterinary Parasitology, Tamil Nadu Veterinary and Animal Sciences University, Veterinary College and Research Institute, Salem, Tamil Nadu, India

Arunachalam K

Department of Veterinary Parasitology, Tamil Nadu Veterinary and Animal Sciences University, Veterinary College and Research Institute, Salem, Tamil Nadu, India

Sunandhadevi S

Department of Veterinary Medicine, Tamil Nadu Veterinary and Animal Sciences University, Veterinary College and Research Institute, Salem, Tamil Nadu, India

Enbavelan PA

Department of Veterinary Medicine, Tamil Nadu Veterinary and Animal Sciences University, Veterinary College and Research Institute, Salem, Tamil Nadu, India

Corresponding Author:

Tamilam TV

Department of Veterinary Parasitology, Tamil Nadu Veterinary and Animal Sciences University, Veterinary College and Research Institute, Salem, Tamil Nadu, India

Babesiosis in a Jersey crossbred heifer: A case report

Tamilam TV, Arunachalam K, Sunandhadevi S and Enbavelan PA

Abstract

Babesiosis is an economically important arthropod-borne blood protozoan disease of bovine occurs worldwide caused by the genus *Babesia*. An one year old jersey cross bred heifer with clinical symptoms of anorexia, anaemia, pyrexia, reduced body weight, haemoglobinurea, enlarged superficial lymph nodes and having tick infestation was brought for checkup. Giemsa stained blood smear revealed the presence of piroplasmic organisms of *Babesia* sp. in RBC. The haematology revealed, packed cell volume (PCV) 14.9%, haemoglobin concentration (HB) 5.7 g/dl and RBC 2.64×10^6 / μ l. Animal was treated with diminazene aceturate (berenil) IM @ 5mg/kg BW and oxytetracycline @ 10mg/kg BW with supportive therapy. The owner was advised to bring back the animal after one week for review. After one week, the peripheral blood smear examination was found to be negative for *Babesia* organisms. Haematology revealed that PCV and haemoglobin concentration values were within the normal range. The animal literally showed a marked improvement and eventually recovered.

Keywords: Babesiosis, red water fever, piroplasms, *Babesia bigemina* and tick fever

Introduction

Bovine babesiosis (BB) is an intra-erythrocytic tick borne blood protozoan disease of cattle and buffaloes caused by the genus *Babesia* (OIE, 2013) [13] and is common in areas where its arthropod vectors are distributed, especially tropical and subtropical climates. Among *Babesia* spp., the two main species known to affect cattle are *Babesia bovis* and *Babesia bigemina*. The disease is mainly transmitted by one host tick *Boophilus* species. Typically, *Babesia* organisms are pyriform, but may be round, elongated or cigar shaped and transfer occur transovarially between tick generations (Gohil, *et al.*, 2013) [7], by fomites and mechanically from contaminated blood (Abdullah, *et al.*, 2013) [1]. *In utero* transmissions have been reported, but are infrequently encountered in calves (Jorgensen, 2008) [10].

Clinically, the disease is characterized by pyrexia, intravascular hemolysis manifested by anaemia, hemoglobinuria and jaundice. The signs can also vary depending on the species of parasite and the host factor such as age and immune status. Bovine babesiosis (BB) is predominantly observed in adult cattle, with *B. bovis* generally being more pathogenic than *B. bigemina* and *B. divergens*. Once the animals were infected develop a lifelong immunity against re-infection with the same species and cross-protection is evident in *B. bigemina*-immune animals against subsequent *B. bovis* infections (Gohil, *et al.*, 2013) [7]. Incubation period is often 2 to 3 weeks or longer after tick infestation.

BB is principally maintained by sub clinically infected cattle that have recovered from the disease. Morbidity and mortality vary greatly and are influenced by prevailing treatments employed in an area, previous exposure to a species/strain of parasite and vaccination status (Chigozie *et al.*, 2014) [4]. Generally young calves exhibit a strong innate immunity in comparison to adult cattle. However, outbreaks can occur in these endemic areas if exposure to ticks by young animals is interrupted or immune naive cattle are introduced.

Case History and Laboratory examination

An one year old jersey cross bred heifer (Fig. 1) was presented at Veterinary Clinical Complex, Veterinary College, Salem with a history of anorexia, emaciation, coffee coloured urine (Fig. 2) and loss of weight. On clinical examination, the heifer showed a rectal temperature of 38.4 °C, pale mucus membrane, presence of ecto parasites (ticks), and enlarged superficial lymph nodes.

The peripheral blood smear and blood sample was collected from the jugular vein in EDTA bottle to check for haemoparasites and haematological analysis respectively. Peripheral blood smear stained with giemsa revealed the presence of piroplasmic organisms *Babesia* sp. in RBC (Fig. 3). The parasite was identified according to the characters described by Soulsby (1982) [14]. The haematology showed, packed cell volume (PCV) 14.9%, haemoglobin concentration (HB) 5.7 g/dl and RBC $2.64 \times 10^6/\mu\text{l}$.



Fig 1: Cross bred heifer



Fig 2: Coffee coloured urine

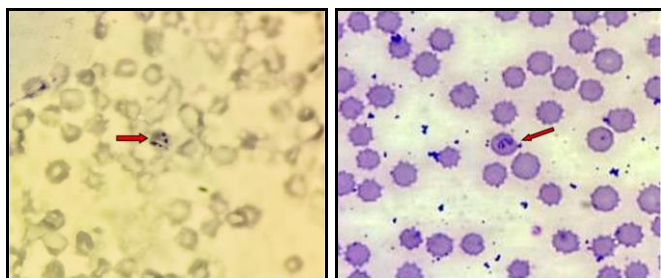


Fig 3: Piroplasmic organisms *Babesia* sp. in RBC

Results and Discussion

The present case, based on clinical symptoms and laboratory examination was diagnosed as bovine babesiosis. The successful treatment of babesiosis depends on the use of effective drugs and early detection (Vial and Gorenflot, 2006) [17]. The ideal combination of imidocarb dipropionate and oxytetracycline is the most effective treatment for Babesiosis in small ruminants (Ijaz *et al.* 2013) [9]. Berenil (diminazene

aceturate) is an antiprotozoal drug for treatment and control of protozoa infection in cattle, sheep, horses and dogs. It also protects cattle against babesiosis and trypanosomiasis for 2 to 4 weeks. In this case, heifer was treated with berenil IM, @ 5mg/kg BW and oxytetracycline @ 10mg/kg BW and also administered with iron and tribivet (vitamin B₁, B₆ & B₁₂) 5 ml IM, as a supplement to hasten RBC production. The owner was advised to bring back the animal after one week for review. After one week, the peripheral blood smear was found to be negative for *Babesia* organisms. Haematological analysis revealed PCV and haemoglobin concentration values were within the normal range. The animal showed marked improvement for ongoing treatment and eventually recovered. The treatment adopted in this case concur with the outcome of Karunakaran *et al.* (2011) [11], Ukwueze and Orajaka (2014) [4] whom successfully treated a 20 day old calf with a single dose of diminazene aceturate and supportive therapy.

Venu *et al.* (2013) [16] also diagnosed and reported *Babesia bigemina* infection in a 14 day old Jersey female calf which showed clinical symptoms of high fever, increased respiratory rate, pale mucous membrane and haemoglobinuria. Bal *et al.* (2016) [2] treated a babesiosis case in cattle successfully with diminazene aceturate, hematinics and antipyretics.

The immune response of cattle to *B. bovis* or *B. bigemina* infection involves both innate and acquired immune mechanisms. Trueman and Blight (1978) [15] and Goff *et al.* (2001) [6] reported that young calves exhibit a strong innate immunity compared to adult cattle. Infected animals with most *Babesia* species develop the immunity against reinfection with the same species. Imidocarb dipropionate is the drug of choice to treat bovine babeiosis followed by dimenazine aceturate, with 100 per cent and 90 per cent efficacy at 10 days post treatment respectively (Niazi, *et al.*, 2008) [12]. In the present report, the animal showed good response to dimenazine aceturate on 7 days post treatment as evident from the blood picture with negative organisms. The most effective procedure for the control of babesiosis is to treat and eradicate the vector of *Boophilus spp.* In order to control babesiosis, the owner was advised to advocate acaricides both on animals and shelters, rotational usage of acaricides and to administer in proper dosage to prevent the acaricidal resistance.

Conclusion

In conclusion, the case study highlights the successful management of bovine babesiosis through a combination of effective drug therapy and supportive care. Treatment with berenil and oxytetracycline, supplemented with iron and vitamins, led to significant improvement in the heifer's condition, as evidenced by negative blood smear results and normalized hematological parameters. This treatment approach aligns with previous successful cases reported in the literature. Additionally, the importance of vector control in preventing babesiosis transmission was emphasized, with recommendations for acaricide use and proper dosage administration to mitigate acaricidal resistance. Overall, early detection and appropriate treatment are crucial for the successful management of babesiosis in cattle.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Abdullah FFJ, Adamu L, Osman AY, Haron AW, Sharee AA. Clinical management of an outbreak of babesiosis in a herd of cattle: A case report. *Journal of Agricultural and Veterinary science*. 2013;4:78-83.
2. Bal MS, Mahajan V, Filia G, Kaur P, Singh A. Diagnosis and management of bovine babesiosis outbreaks in cattle in Punjab state. *Veterinary World*. 2016;9:1370-1374.
3. Bock R, Jackson L, de Vos A, Jorgensen W. Babesiosis of cattle. *Veterinary Parasitology*. 2004;129:S247-S269.
4. Chigozie S, Ukwueze F, Chioma Orajaka. Babesiosis in a Calf: A Case Report. *IOSR Journal of Agriculture and Veterinary Science*. 2014;7(11):72-74.
5. Cooke BM, Mohandas N, Cowman AF, Coppel RL. Cellular adhesive phenomena in apicomplexan parasites of red blood cells. *Veterinary Parasitology*. 2005;132:273-295.
6. Goff WL, Johnson WC, Parish SM, Barrington GM, Tuo W, Valdez RA. The age related immunity in cattle to *Babesia bovis* infection involves the rapid induction of interleukin-12, interferon-gamma and inducible nitric oxide synthase mRNA expression in the spleen. *Parasite Immunology*. 2001;23:463-471.
7. Gohil S, Susann H, Svenja G, Brian MC. Bovine babesiosis in the 21st century: Advances in biology and functional genomics. *International Journal for Parasitology*. 2013;43:125-132.
8. Gohil S, Kats LM, Sturm A, Cooke BM. Recent insights into alteration of red blood cells by *Babesia bovis*: moovin' forward. *Trends Parasitology*. 2010;26:591-599.
9. Ijaz M, Rehman A, Ali MM, Umair M, Khalid S, Mehmood K, *et al.* Clinico-epidemiology and therapeutical trials on Babesiosis in Sheep and goats in Lahore, Pakistan. *The Journal of Animal and Plant Sciences*. 2013;23:666-669.
10. Jorgensen WK. *The Merck Veterinary Manual* 9th Edn. The Merck & Co Inc, Whitehouse Station, NJ, USA, 2008, 21-26.
11. Karunakaran S, Narayana U, Kurisakose AM, Aswathy G, Rajimon KT, Sumangala M. *Babesia bigemina* infection in twenty day old calf: clinical report. *Journal of Indian Veterinary Association, Kerala*. 2011;9(1):49-50.
12. Niazi N, Khan MS, Avais M, Khan JA, Pervez K, Ijaz M. Study on Babesiosis in calves at livestock experimental Station Qadirabad and adjacent areas, Sahiwal (Pakistan). *Pakistan Journal of Agricultural Science*. 2008;45(2):209-211.
13. OIE, 2013. Bovine babesiosis in OIE Update.
14. Soulsby E.J.L. *Helminths, arthropods and protozoan of domesticated animals*, 7 th edn., Bailliere Tindall and Cassell Ltd., London. 1982.
15. Trueman KF, Blight GW. The effect of age on resistance of cattle to *Babesia bovis*. *Australian Veterinary Journal*. 1978;54:301-305.
16. Venu R, Sailaja N, Rao KS, Jayasree N, Prasad WLN. *Babesia bigemina* infection in a 14 day old Jersey crossbred calf: A case report. *Journal of Parasitic Diseases*. 2013. DOI:10.1007/s12639-013-0338-x.
17. Vial H, Gorenflot A. Chemotherapy against babesiosis. *Veterinary Parasitology*. 2006;138:147-160.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to Cite This Article

Tamilam TV, Arunachalam K, Sunandhadevi S, Enbavelan PA. Babesiosis in a Jersey crossbred heifer: A case report. *International Journal of Veterinary Sciences and Animal Husbandry*. 2024;SP-9(3):211-213.