

Therapeutic Management of Bovine Babesiosis in a Holstein Friesian Cross-Bred Heifer

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Abstract

Babesia bigemina infection was diagnosed in two Holstein Friesian cross-bred cows (six and five years old) and a ten-month-old Holstein Friesian cross-bred heifer after 10 days of transportation. Heifer started to show the symptoms of high rise of temperature, pale conjunctiva and haemoglobinuria, whereas rest two cows did not show any clinical symptom. No ticks were observed after close examination of all three animals. *B. bigemina* was found in all three Giemsa stained blood smear. Since 2 cows did not show any clinical symptom of the disease hence, only the heifer was treated with diminazeneaceturate@ 5mg/kg body weight along with supportive drugs. Asymptomatic cows were left untreated; further, both these asymptomatic animals did not show any clinical symptom of the disease even after duration of 10 months. From that study we can conclude that presence of tick is not necessary for confirmation of disease and asymptomatic animals should not be treated for babesiosis.

Keywords: Asymptomatic Cows, Bovine Babesiosis, Diminazeneaceturate, Giemsa Stain



Introduction

Babesia belongs to family Babesiidae, order Piroplasmida and phylum Apicomplexa responsible for babesiosis in variety of domestic and wild animals. The *B. bigemina* and *B. bovis* are the most common species for babesiosis in tropical and sub tropical regions. The annual losses due to babesiosis have been reported to be 57.2 million USD in India (McLeod and Kristjanson, 1999). It is also reported that susceptibility of cross bred cattle is more than zebu against babesiosis. (Jithendran, 1997). *Babesia* is an intracellular protozoa present within RBCs of vertebrate host, from where it multiply by asexual division and producing 2, 4 or more trophozoites. The liberated trophozoites infect large number of red blood cells. The morbidity and mortality rates depend on species of *Babesia* and various host factors like age, stress and immune status. Generally, there are clinical signs of high rise of body temperature, increased pulse and heart rate, pale conjunctiva and haemoglobinuria (Soulsby, 2015). After recovery with *B. bovis*, animal remain immune for several years while after recovery with *B. bigemina*, animal remain immune for only few months (Phillips, 1971). It is very difficult to find out *Babesia* infection under microscope after recovery of animal. (Rajkumar *et al.*, 2020). After recovery from *Babesia* infection or latent infection, sometimes, immune status of animals become break down due to stress by transportation, starvation or parturition that results in development of the disease (Radostits *et al.*, 2000).

Case History

Two Holstein Friesian cross-bred cows (six and five years old) and a ten-month-old Holstein Friesian cross-bred heifer were transported from Military Dairy Farm, Jhansi on 22nd July 2019 to Krishi Vigyan Kendra, Datia. After 10 days of transportation the heifer started to show the symptoms of high rise of temperature, pale conjunctiva and haemoglobinuria, whereas, rest two cows did not show any clinical symptom. The clinical examination of heifer revealed rectal temperature of 106°F, pale mucus membranes, haemoglobinuria. There was no ticks on animal body at time of examination. Since animals were getting wheat bhusa and mineral mixture which ruled out the possibility of hypophosphataemia, therefore, for confirmation of the causative agent, blood samples of all the three animals was collected from ear vein and thin blood smears were prepared. The smears were fixed with methanol and sent to Department of Veterinary Parasitology, College of Veterinary Science and Animal husbandry, Mhow, Madhya Pradesh.

Laboratory Examination

The fixed blood smears with methanol were stained with Giemsa stain (Giemsa stain solution, Himedia) (1:10 dilution) for 30-40 minutes and then extra stain was poured off and washed with distilled water from one end of slide. The microscopic examination of blood smears were confirmed *Babesia* in RBCs. The morphology of parasite revealed blue cytoplasm and red chromatin granules at one pole of parasite and they appeared as pear shaped bodies lying at an angle with the narrow ends in a position, and it was a large form of parasite with more than 3 µm average length (Soulsby, 2015).

Results and Discussion

All the three blood smears were found positive for *B. bigemina*, and their level of parasitaemia was 2%, 5%, and 8%, respectively in two Holstein Friesian cross-bred cows (six and five years old) and a ten-month-old Holstein Friesian cross-bred heifer. Since both the adult cows did not show any clinical symptom of the disease hence only the heifer was treated with antibabesia drug, diminazene aceturate @ 5mg/kg body weight. The effectiveness of diminazene aceturate is more in case *B. bigemina* as compare to *B. bovis* (Kuttler, 1981). Meloxicam @ 0.5 mg /kg body weight i/m for 3 days, haematinic 10 ml i/m thrice weekly for one week and Inj. Rintose 500 ml i/v daily for 3 days were also administered as supportive therapy. After one week of treatment, again blood smear examination was performed which revealed absence of *B. bigemina*. Similar observation post treatment with diminazene was also reported by Maharana *et al.*, 2016. On the enquiry from military dairy farm it came in notice that all the three purchased animals were not having the history of babesiosis. Based on the findings of the present study, it can be inferred that, if blood sample is positive for *B. bigemina* without clinical symptoms, treatment of such animal is not required in order to maintain the premune status by maintaining low grade infection (Todorovic *et al.*, 1973). Considering this fact, asymptomatic cows were left untreated, further, both these asymptomatic animals did not show any clinical symptom of the disease even after a duration of 10 months. The young calves exhibit a strong innate immunity compared to adult cattle (Trueman and Blight, 1978; Goff *et al.*, 2001). In the present study, age

of the Holstein Friesian cross-bred heifer was 10 months, this could be the reason that natural resistance which is generally observed up to 9-12 months might have disappeared from 9 months onward or travelling stress might be the reason for appearance of the clinical form of the disease. (Soulsby, 1987). Acquired immunity can persist for several years (Callow *et al.*, 1967) and the termination of subclinical infection by drug treatment results in immunity to reinfection for at least six months. Subclinical infection should not be treated too early otherwise effective immunity would not be induced. Infected animals with *Babesia* species develop the immunity against reinfection with the same parasite species. Zintl *et al.* (2005) observed that the calves infected with *Babesia* spp. do not develop severe clinical babesiosis and instead they display persistent low parasitaemia without any apparent ill-effects.

Conclusion

In the present study, ticks were not observed on the body of infected animals which is indicating that presence of ticks is not necessary for confirmation of the disease. The possibility of transmission of parasites before acaricide treatment could not be ignored. There may be possibility of transmission of parasite through trans-placental route and animal did not show clinical signs in early stage because of inverse age resistance. In this paper, authors want to put on record that presence of ticks is not necessary for confirmation of disease and asymptomatic animals should not be treated for babesiosis.

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Conflict of Interests

There is no conflict of interest.

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