Research Article……..

International Journal of Agricultural Invention

(online available at www.agriinventionjournal.com)

***International Journal of Agricultural Invention* 8(1): 29-32: June, 2023**

ISSN: 2456 – 1797 (P)

Therapeutic management of Bovine babesiosis in four HF crossbred cattle

***Pramod Kumar[1], Krishna Mohan[1], R. K. Asthana[2], A. Kundu[3]**

[1]Animal Production Research Institute, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar, India
[2]CoEIB, RGM, Piprakothi, Animal Production Research Institute, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar, India
[3]RGM Project, Piprakothi, Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar, India
***Corresponding email**: *pramod.kumar@rpcau.ac.in*

ARTICLE INFO

Research Article
Received on February 05, 2023
Revised on February 15, 2023
Accepted on March 11, 2023
Published on April 06, 2023

Article Authors
Pramod Kumar, Krishna Mohan, R. K. Asthana, A. Kundu

Corresponding Author Email
pramod.kumar@rpcau.ac.in

PUBLICATION INFO

International Journal of Agricultural Invention (IJAI)
RNI: UPENG/2016/70091
ISSN: 2456-1797 (P)
Vol.: 8, **Issue:** 1, **Pages:** 29-32
Journal Homepage URL
http://agriinventionjournal.com/
DOI: 10.46492/IJAI/2023.8.1.5

ABSTRACT

Four crossbred cattle were presented in Animal Production Research Institute, Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar with history of coffee color urine, raised body temperature, anaemia, weakness, anorexia, pale mucous membrane. Their clinical and haemato biochemical finding reveals bovine babesiosis. The etiology of this disease is intracellular protozoal parasite called *Babesia bigemina and Babesia bovis* and are transmitted from diseased animal to healthy animals through *Riphicephalus microplus and Riphicephalus annulatus* ticks and mites. Haemogram revealed anaemia (decreased Hemoglobin), reduced PCV (Packed cell volume) in three cows, reduced number of RBC, elevated BUN (Blood urea nitrogen) and decreased blood glucose level. These animals were successfully treated with Diaminazine Diaceturate and Oxytetracycline long acting drugs along with symptomatic supportive therapy.

KEYWORDS

Therapeutic Management, Bovine Babesiosis, HF Crossbred Cattle

HOW TO CITE THIS ARTICLE

Kumar, P., Mohan, K., Asthana, R. K., Kundu, A. (2023) Therapeutic management of Bovine babesiosis in four HF crossbred cattle, *International Journal of Agricultural Invention*, 8(1): 29-32. DOI: 10.46492/IJAI/2023.8.1.5

Babesiosis is an important haemo-protozoan parasitic disease of cattle. It is also known as red water disease. Its etiological agent is protozoa, *Babesia bigemina and Babesia bovis* of family Babesiidae and order Piroplasmida. It is intracellular parasite and is transmitted from affected to healthy animals through tick, *Riphicephalus microplus* (formerly known as *Boophilus microplus*) and *Riphicephalus annulatus* (formerly known as *Boophilus annulatus*) (Murrell *et al*., 2001). Babesia can be transmitted transovarially. They are one-host ticks that complete their life cycle on a single host *i.e*. cattle.

This disease is responsible for heavy economic losses to dairy farmers in India (Narladkar, 2018) due to either death of affected animal or milk production losses or reduced working efficiency of the affected animals (Chakrabarti, 2016). Exotic cattle (*Bos taurus*) like Holstein Frisian and Jersey, and their crossbred, specially under stress conditions are much susceptible to this disease (Radostits *et al*., 2000). However, Indigenous cattle (*Bos indicus*) are comparatively resistant (Bock *et al*., 2004).

Its occurrence is common in tropical and subtropical countries (Gupta *et al*., 2006 and Radostits *et al*., 2010) as hot and humid climatic condition favors ticks growth. In tropical part of India *Babesia bigemina* is the major species found in bovines (Ruprah, 1985). Major clinical symptoms of this disease are hemoglobinuria, anaemia, high body temperature, jaundice and anorexia which results in to significant morbidity and mortality losses in cattle. Abortion in pregnant cow may occur due to reduced body condition (Salem *et al*., 2016). This disease is acute or sub-acute in nature and cause sudden death of cattle or within a few days, if remain untreated. Babesiosis is second most widespread blood-borne disease of animals (Homer *et al*., 2000) and is an important emerging zoonotic disease with potential threat to human population (Homer *et al*., 2000 and Zintl *et al*., 2003).

History and Clinical Observations

In the month of July-August, 2022 four Holstein Frisian crossbred cows, one from cattle farm of Animal Production Research Institute, Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar and three farmers crossbred cows, were presented with the history of coffee color urine, raised body temperature, anaemia, weakness, anorexia, pale mucous membrane and moderate to heavy ticks infestation of body surface. Rectal temperature of cows varies from 102^0F to 105.8^0F (table 1). Vulval and conjunctival mucous membrane were pale in color (fig 1 and 2). Elevated respiratory rate (Tachyponea) was also observed in all the cases. Prescapular lymph nodes were moderately enlarged bilaterally. For further clinical and hematobiochemical examination urine, blood and serum samples were collected.

Table 1. Clinical findings of the cows

Parameters	Rectal Temperature (^{0}F)	Pre-Scapular Lymph Node	Urine Color	Respiration Rate (bpm)	Mucous Membrane	Anorexia Since Days
Cows 1, from Cattle Farm	104.5	Enlarged	Red	41	Pale	Two
Cows 2, Farmers Cow	102	Moderate	Red	38	Pale	Five
Cows 3, Farmers Cow	105.8	Enlarged	Red	42	Pale	Three
Cows 4, Farmers Cow	104	Enlarged	Red	41	Pale	Three

Table 2. Hemato-biochemical findings of affected cows

Parameters	Hb (g/dl)	PCV %	RBC (mill/cum)	BUN (mg/dl)	Glucose (mg/dl)
Cow1	5.4	28	3.9	44.2	51
Cow2	5.1	44	3.1	45	44
Cow3	5.4	30	3.8	38	45
Cow4	5.5	25	3.6	36	49

Collected urine sample were red colored due to heavy haemolysis of RBC (Red Blood Corpuscles) with froth formation on top of urine samples (fig 3).

Diagnosis and Treatment

Rectal temperature and respiration rate were found elevated in three out of four cases. Moderate to dark coffee colored urine was observed in all the cows. Vulvar and conjuctival mucosa were pale in color. Ticks and mites infestation were also observed.

Haemogram revealed anaemia (decreased Hemoglobin), reduced PCV (packed cell volume) in three cows, reduced number of RBC, elevated BUN (Blood urea nitrogen) and decreased blood glucose level (table 2). On the basis of history and subsequent clinical finding babesiosis was suspected in all the four cases. It was confirmed by presence of intra-erythrocytic *Babesia bigemina*, for which peripheral Blood were taken, smears were prepared and stained with Giemsa stain. Smear slides were examined under oil immersion to find babesia protozoa inside RBC.

All the cows were treated with antiprotozoal drug Inj. Nilbery (Diaminazine Diaceturate and phenazone, Intas Pharma) @ 4mg/kg body weight by IM single dose and Inj. Oxy LA (Oxytetracycline long acting, Selmore Pharmaceuticals) @ 20 mg / kg body wt IM two doses at 48 hours interval. Cows with pyrexia were given Inj. Melonex (Meloxicam, Intas Pharma) 15 ml IM. To improve hypoglycemic condition Intalyte Infusion (Dextrose *etc*.) 1000 ml, IV, at 12 hours interval, three doses, was given along with Inj Conciplex (Vit B complex, Concept Pharmaceuticals) 5 ml in each infusion bottle. Liq. Supplement Sarkoferrol Vet (Alembic Pharma) 2.5 kg @ 50 gm/day orally and Brotone liq. (Liver tonic, Virbac Animal Health) @ 50 ml/day orally were advised for faster improvement in anemic condition. Inj. Neomec LA (Ivermectin 3.15% w/v, Intas Pharmaceuticals) 10 ml SC was given as remedy for ticks and mites infestation. Taktic (Amitraz, Intervet) @ 2 ml/lit of water was advised for topical application on the body surface and on premises to control tick vectors.

In treated cows urine color returns to normal in 24 to 48 hours after treatment. All the cows showed improvement in general alertness, feed and water intake after 3-5 days of treatment. After twenty days mucous membrane turns pinkish in color, regain body condition, milk production and luster.

Discussion

Tick-borne haemoprotozoan infections have been a persistent challenge to domestic cattle production in India owing to the prevailing conducive environment for the survival of ticks. Among these, bovine babesiosis requires a special mention as the impact of the disease is highly evident in India (McLeod and Kristjanson, 1999). The significant aspect of the epidemiology of bovine babesiosis in India is the presence of carrier animals. Animals that recover from clinical disease become persistently infected with *B. bovis* and/or *B. bigemina* with low levels of parasitemia that serve as a source of infection to susceptible animals through competent tick vectors (Howell *et al*., 2007). The increase in disease prevalence may also be attributed to the change in climate that might have led to the expansion of the niche of vectors (Bram *et al*., 2002).

Further, the emergence of drug resistant parasites and acaricide resistance in the recent years might have equally contributed to the increased prevalence of bovine babesiosis in India (Sagar *et al*., 2020).

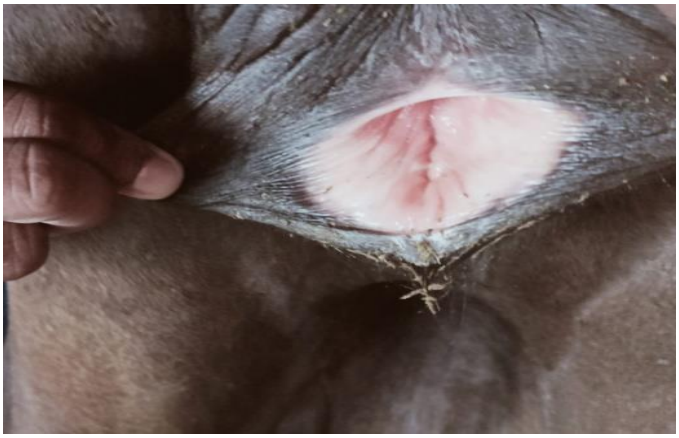

Fig 1. Pale vulval mucous membrane of cow

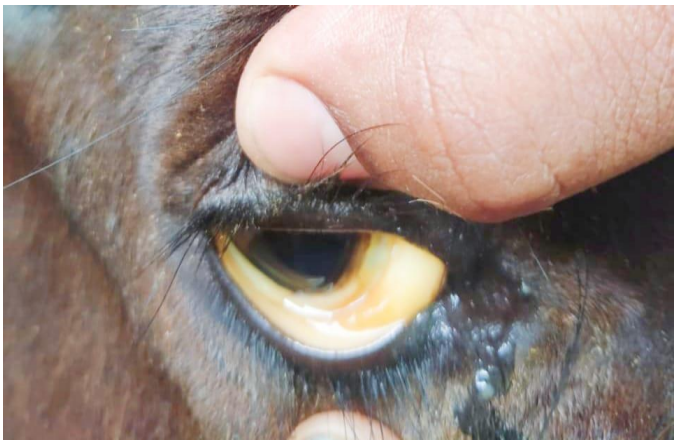

Fig 2. Pale conjunctiva of cow

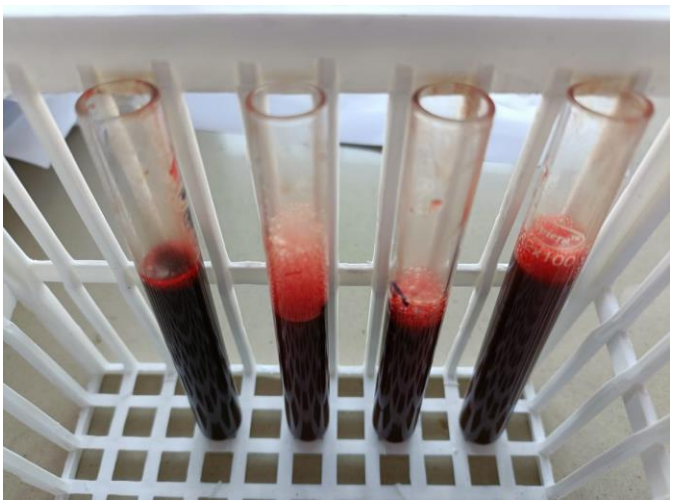

Fig 3. Coffee color urine of affected cows with froth formation on top

Conclusion

The present case report concludes that Babesiosis is an important tick borne haemo-protozoan disease of cattle. Hemoglobinurea, jaundice, pyrexia and anorexia are common symptoms. Presence of intra-erythrocytic babesia protozoa confirms this disease. Prompt diagnosis, following appropriate therapeutic action and correct line of treatment are very important for better prognosis. Vaccine for babesiosis is also available. Control of tick vectors can reduce incidence of this disease in cattle.

References

Bock, R., Jackson, L., De Vos, A., Jorgensen, W. (2004) Babesiosis of cattle, *Veterinary Parasitol*, **129**: 247–269.

Bram, R. A., George, J. E., Reichard, R. E., Tabachnick, W. J. (2002) Threat of foreign arthropod-borne pathogens to livestock in the United States, *J. Med. Entomol*., 39(**3**): 405–416.

Chakrabarti, A. (2016) A Textbook of Preventive Veterinary Medicine, 2nd edn. Kalyani Publishers, New Delhi.

Homer, M. J., Delfin, I. A., Telford, S. R., Krause, P. J., Persing, D. H. (2000) *Babesiosis. Clin. Microbiol. Rev.*, **13**: 451-469.

Howell, J. M., Ueti, M. W., Palmer, G. H., Scoles, G. A., Knowles, D. P. (2007) Persistently infected calves as reservoirs for acquisition and transovarial transmission of *Babesia bovis* by Rhipicephalus (Boophilus) microplus, *J. Clin. Microbiol*., 45(**10**): 3155–3159.

Mcleod, R. and Kristjanson, P. (1999) Final report of joint esys/ILRI/ACIAR Tick Cost project – Economic impact of ticks and tick-borne diseases to livestock in Africa, Asia and Australia. International Livestock Research Institute, Nairobi.

Murrell, A., Campbell, N. J. H., Barker, S. C. (2001) A total evidence phylogeny of ticks provides insights into evolution of life cycles and biogeography, *Mol. Phylogenet. Evol*., **21**: 244-258.

Narladkar, B. W. (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(**2**): 151.

Radostits, O. M., Gay, C. C., Blood, D. C., Hinchcliff, K. W. (2000) Veterinary Medicine, 9th edn, W. B. Sounders, London.

Radostits, O. M., Gay, C. C., Hinchcliff, K. W., Constable, P. D. (2010) Veterinary Medicine, A textbook of the diseases of cattle, horses, sheep, pigs and goats, 10 the dn., pp: 2045- 2050.

Ruprah, N. S. (1985) Text Book of Clinical Protozoology, Oxanian Press Pvt. Ltd. New Delhi, pp: 287-304.

Sagar, S. V., Saini, K., Sharma, A. K., Kumar, S., Kumar, R., Fular, A., Shakya, M., Upadhaya, D., Nagar, G. C. S., Samanta, S., Kumar, S., Ghosh, S., (2020) Acaricide resistance in Rhipicephalus microplus collected from selected districts of Madhya Pradesh, Uttar Pradesh and Punjab states of India, *Trop. Anim. Health Prod*., **52**: 611–618.

Salem, N. Y., El-sherif, M. A. (2016) Clinical, hemato-biochemical alterations and –antioxidant biomarkers in Babesia infected calves, *Int. J. Vet. Sci. and Med*., **4**: 17-22.

Zintl, A., Mulcahy, G., Skerrett, H. E., Taylor, S. M., Gray, J. S. (2003) *Babesia divergens*, a bovine blood parasite of veterinary and zoonotic importance, *Clin. Microbiol. Rev*., **16**: 622-636.