Case Report

A Study of the Clinico-Haematological Profile and Therapeutic Management of Acute Babesiosis in A Cross-Bred Jersey Cow – A Case Report

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Received: 11-02-2021; **Revised:** 15-04-2021; **Accepted:** 23-04-2021; **Published on:** 15-05-2021.

ABSTRACT

Babesiosis is a tick-borne disease caused by protozoans of the genus Babesia. It causes haemolytic anaemia, fever, and occasionally hemoglobinuria, as well as death. A cross-bred jersey cow, aged 6 years, was brought to the Government Veterinary Hospital in Cheruthuruthy with symptoms of fever, anorexia, passing coffee-colored urine, and low milk yield. Babesia spp. is found in all the cows after blood smears were examined. Although their sensitivity and specificity are reduced, microscopy detection methods are still the cheapest and fastest methods for identifying Babesia parasites. Hb, PCV, and TEC levels were found to be lower in haematological studies. Hyperglycemia, hyperbilirubinemia, BUN, AST, and hypoprotienemia were discovered in the blood. Haemoglobin, glucose, and bile pigments were found in the urine. The cow was successfully treated with diminazene aceturate (Berenil) at 2.5 mg/kg body weight in conjunction with supportive treatment.

Keywords: Hemoglibinuria, cattle, anemia, jaundice, BUN.

QUICK RESPONSE CODE →

DOI: 10.47583/ijpsrr.2021.v68i01.010

DOI link: http://dx.doi.org/10.47583/ijpsrr.2021.v68i01.010

INTRODUCTION

Babesiosis is a parasitic infection transmitted by ticks that causes significant morbidity and mortality in a wide variety of domestic and wild animals, as well as humans. It is the most common disease in cattle worldwide, and it is spread by blood-sucking Ixodidae ticks (hard ticks). Babesia bovis and Babesia bigemina, the two most common species, are present in most tropical and subtropical regions[2]. Babesiosis is the second most common blood-borne disease in animals, and it is gaining growing attention as an emerging zoonosis in humans, thanks to the widespread distribution of the ixodid tick[1,2]. The economic losses from these two organisms can be considerable, particularly in developing countries.

MATERIALS AND METHODS

A 6-year-old cross-bred jersey cow was brought to the Government Veterinary Hospital Cheruthuruthy with symptoms of fever, anorexia, passing coffee-colored urine, decreased milk production, depression, and a reluctance to travel. Elevated temperature of 105.2°F, elevated heart rate and respiration, dyspnoea, suspended rumination, presence of icteric mucus membranes (Fig. 1 and Fig. 2) with mild to moderate tick infestation, and swollen lymphnodes with haemoglobinuria (Fig. 3) were all detected on clinical review.

Figure 1: Icteric conjunctival mucous membrane

Figure 2: Icteric vaginal mucous membrane

Figure 3: Enlarged lymph nodes and haemoglobinuria

RESULTS AND DISCUSSION

Blood and serum were taken for processing in the laboratory. Babesia spp. was used in 50% of the RBCs in blood smears (Fig. 4). Hb, PCV, TEC, and platelet counts were all exceptionally low on the haemogram. Hyperglycemia, hyperbilirubinemia, BUN, AST, and hypoprotienemia were discovered in the blood. Table 1 summarises the results. Haemoglobin, glucose, and bile pigments were all included in the urine, which was coffee-colored.

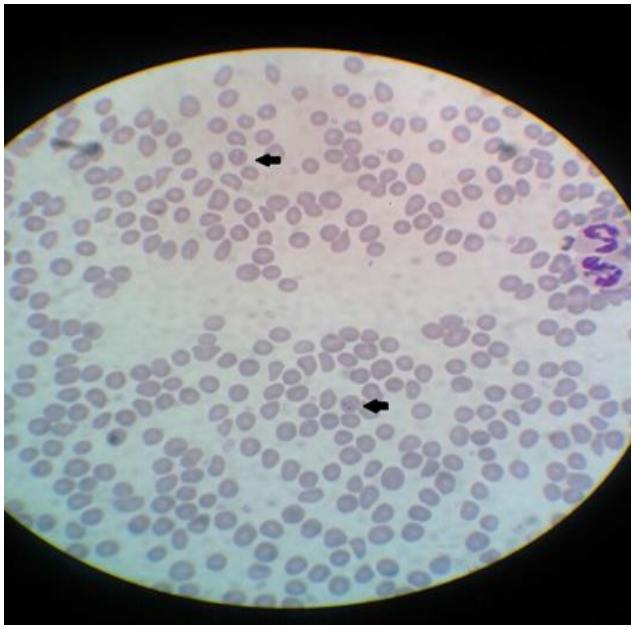

Figure 4: Microscopic view of blood smear with Babesia organisms

The animal was given a single dose of Diminazine accurate (Inj. Berenil RTU, Hoechst®) 2.5 mg/kg Bwt i/m at two separate locations in the neck muscles, long acting oxytetracycline (Inj. Intamycin-LA, Intas Pharmaceuticals) @ 20 mg / kg body wt i/m at 48 hour intervals on two occasions, haematinic (Inj. Feritas, Three animal's temperature dropped dramatically to 1020F after three days. After three weeks, the levels of haemoglobin and PCV had increased. Treatment with diminazene aceturate was effective. Three animals' temperatures dropped dramatically to 102°F after three days. After three weeks, the levels of haemoglobin and PCV had increased. The treatment with diminazene aceturate at 2.5 mg/kg body weight combined with supportive therapy was effective.

Table 1: Average Hemato-biochemical values and urine analysis of affected cows

Parameters	Normal values	Pre-treatment values	Post-treatment values
Hemoglobin (g/dL)	8 – 15	4.23	9.35
PCV (%)	24 - 46	15.4	23.74
TEC X 10^6 /µL	5 – 10	2.30	5.44
TLC X 10^3 /µL	4 – 12	14.25	9.30
MCV (fL)	40 - 60	37.23	46.75
MCH (pg)	11 - 17	11.54	15.29
MCHC (g/dL)	30 - 36	23.21	32.55
Platelets / µL	100000 - 800000	57000	92000
Neutrophils (%)	20 - 45	40	46
Lymphocytes (%)	45 - 75	51	48
Monocytes (%)	2 – 7	2	3
Eosinophils (%)	2 – 8	7	3
Basophils (%)	0 – 1	-	-
Serum Biochemical Values			
AST (U/L)	78 - 132	167	124
TP (g/dl)	5.7 – 8.1	5.8	6.1
BUN (mg/dl)	6 – 27	32	24
Tot. Bilirubin (mg/dl)	0.01 - 0.5	0.9	0.36
Glucose (mg/dl)	45 - 75	110	65
Creatinine (mg/dl)	1 – 2	0.9	0.83
Urine analysis			
Blood (Hb)	-	+++	-
Glucose	-	±	-
Bile pigments	-	++	±

Babesiosis is a tick-borne disease caused by protozoans of the genus Babesia. It causes hemolytic anaemia, fever, and occasionally hemoglobinuria, as well as death[6]. 103 parasites inoculated intravenously is thought to be the minimum infective dose needed to cause overt disease. The prepatent duration, peak parasitemia, and haematological response all change dramatically depending on the number of parasites injected. The immune state of the host and the virulence of the infecting

virus, in addition to the number of infected ticks that feed on an animal. Subclinical infections are very common and are often overlooked by farmers. Subclinical infections are very common, and most farmers and clinicians are unaware of them. Affected animals have low parasitemia, can experience moderate fever and anorexia, and recover normally[8,9] In the present cases, hemoglobinuria, which is often the first clinical sign seen by the owner, occurs at the height of the hemolytic crisis. A brief lymphocytosis and monocytosis occur shortly after the hemolytic crisis, resulting in leukocytosis[1]. Babesiosis detection and treatment are critical tools for babesiosis management. Microscopy detection methods are also the most cost-effective and time-saving methods for detecting Babesia parasites. Although their sensitivity and specificity are reduced, microscopy detection methods are still the cheapest and fastest methods for identifying Babesia parasites[4]. When the tick population is very high, the disease can be so extreme that it causes mortality within a few days, after which the PCV decreases below 20% and the parasitaemia, which is typically detectable until the clinical signs occur and can affect anywhere from 0.2 percent to 45 percent of the red cells, depending on the babesia species, can affect anywhere from 0.2 percent to 45 percent of the red cells[9]. The majority of the clinico-haemotological results in our cases were close to those previously recorded[5,7]. Babesiosis treatment has been focused on the use of antibiotics for years. The majority of the clinico-haemotological results in our cases were close to those previously recorded[7]. Babesiosis care has traditionally relied on a small number of medications, such as imidocarb or diminazene aceturate. Several pharmacological compounds have recently been developed and tested, providing new approaches to manage the disease[4,5]. Diminazene aceturate is made up of an organic base and an organic acid, but it dissociates when dissolved in water. It is normally administered intramuscularly in doses of 3-5 mg/kg. A prophylactic activity of long-acting oxytetracycline against Babesia divergens infection has been demonstrated[8]. The species were successfully eradicated in humans after treatment with quinine and clindamycin. Following animal tests, the efficacy of this combination of antimicrobial agents was confirmed[4,9]. In babesiosis, a long convalescent period results in a significant loss of productivity for a long time[1,2]. The animals were given oral haematenics and B-complex for three weeks before they were fully healed from anaemia.

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Source of Support: None declared.

Conflict of Interest: None declared.