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Therapeutic management of canine babesiosis associated with acute renal failure

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Abstract

Canine babesiosis has worldwide significance caused by several *Babesia* spp. which readily parasitize red blood cells and causes progressive anemia associated with high morbidity and mortality. The disease onset is often acute with affected dogs suffering from fever and lethargy and thereafter may display clinical manifestations of anaemia, liver, kidney dysfunction, and haemostatic abnormalities. Five cases of different breeds of canine presented to Teaching Veterinary Clinical Complex Hospital, Hassan during the month of August 2018 to January 2019 with the history of Anorexia, High fever with vomiting in greenish colour and low platelet count which had not been responding to any treatment. Diagnosis was confirmed for *Babesia canis* on microscopic examination. Serum analysis revealed elevated serum creatinine levels above 1.2 mg/dl is an indicative of renal failure. The animals were treated with imidocarb dipropionate at the rate of 6.6 mg /kg Body weight, once in a week for two weeks. Clindamycin was given at the rate of 11 mg/kg Body weight orally along with blood transfusion as supportive therapy. In addition, Erythropoietin injection was given to the all animals at the rate of 100 I.U /Kg Body weight intravenously thrice in a week for 4 weeks. Phosphate binders such as calcium acetate (Ipkatine ®, Vetoquinol) 30 gram twice daily for one month. The combination of Imidocarb dipropionate, clindamycin along with Blood transfusion as supportive therapy yielded in effective treatment of Canine Babesiosis.

Keywords: Babesiosis, imidocarb dipropionate, blood transfusion, erythropoietin

Introduction

Canine Babesiosis is one of the clinically significant tick borne diseases caused by *Babesia gibsoni*, the small piroplasm or *Babesia canis*, the large piroplasm. The large piroplasm is classified into three different phylogenetic groups referred to as subspecies *Babesia canis*, *Babesia canis vogeli*, and *Babesia canis rossi*, of which *B. canis vogeli* is commonly reported from India ^[1]. Recently, in Bangalore, Prevalence of Canine Babesiosis was transmitted by *R. sanguineus* was 54.84 percent, whereas *R. Haemaphysalis* was 45.15 percent ^[2]. *Babesia canis* is transmitted by the *Dermacentor reticulatus* tick and infects canine red blood cells and damages the erythrocyte cell membrane, resulting in increased osmotic fragility and subsequent intravascular hemolysis ^[3]. Clinically canine babesiosis is characterised by High fever, jaundice pale or icteric mucous membranes, hematuria and epistaxis lymphadenopathy and thrombocytopenia. Direct microscopic examination of the stained blood smear is the most commonly used method as it is cost effective diagnostic method ^[4]. Canine Babesiosis primarily involves erythrocyte destruction, it may also result in multisystemic involvement. Acute renal failure is considered to be one of the most prevalent complications of canine babesiosis. This complication leads to a decrease in the glomerular filtration rate and in consequence causes azotemia and uremia ^[5]. In complicated form of babesiosis clinical manifestations depend up on the type of particular complication that develops. Severe form of the disease exhibits marked haemolytic anaemia, severe acid-base abnormalities with frequent secondary multiple organ failure and complications such as acute renal failure (ARF), hepatopathy with marked icterus, hypoglycaemia. Dogs with haemo-concentrated babesiosis develops acute renal failure, acute respiratory distress syndrome or cerebral babesiosis have the worst prognosis and mortality can be greater than 50 percent and in some cases approaches 100 percent ^[6]. The Present study focuses on the clinical, haematological and biochemical observations in canine babesiosis with successful therapeutic management.

Materials and Methods

History and clinical signs

Five cases of different breeds of canines were brought to the Department of Veterinary Clinical Complex, Veterinary College, Hassan, with a complaint of anorexia from 15 days, fever, vomiting since 4 days. Owner reported oliguria and urine is yellow coloured, tick infestation on body parts and reluctant to move. On clinical examination the animal was found to be anaemic with very pale mucosa, tachycardia and orthopnea. It appeared dull and listless. However the general body condition appeared to be moderately good

Microscopic examination

Blood smear was prepared at high body temperature from ear vein stained with Giemsa stain and examined under microscope. Blood was collected for haematological examination. Thin blood smears from the ear tip in duplicate from each suspected cases were prepared on clean, grease free micro slides, air dried and fixed using methanol. The fixed blood smears were stained by Giemsa stain using 1:10 dilution for 30 – 40 minutes. The slides were washed under running tap water, air dried and examined microscopically at 1000 times magnification under oil immersion for haemoparasites. Diagnosis was made on the basis of blood smear examination [7].

Hematology and Biochemical Parameters

The blood sample collected in tubes coated with K3EDTA was immediately analyzed for complete hematological examination using fully automated Hematology cell counter (Erma inc.) and the blood collected in serum vial was analysed for serum analysis using Biochemical analyser (Swemed company).

Blood transfusion

Blood was collected from Jugular vein from Healthy Donor around 350 ml and it was subjected for Hematological examination, the Packed cell volume (PCV) and Haemoglobin values were found to be normal and free from haemoprotezoa and which is already vaccinated and Dewormed. Blood transfusion was successfully carried out by using HL-HAEMOPACK CPDA Blood bag @ HLL-life care Ltd. India (Fig.3). Cross matching was performed by adding 25 microliter of Donor RBC and 25 microliter of Recipient serum on clean glass slide, as there was no agglutination, it was compatible for transfusion (Fig.4). The volume of blood to be administered to the patient was calculated using the following formula: $\text{Volume (mL)} = \text{Recipient Body weight (Kg)} \times 90 \times (\text{Recipient desired PCV} - \text{Current PCV}) / \text{PCV of Donor Blood}$ [8]. Heart rate, Respiration rate were monitored during the transfusion at every 5 minutes in the first 20 minutes to avoid any adverse reactions.

Results and Discussion

Peripheral blood smear (ear pricks) revealed pyriform in shape, pointed one end, and round on other indicates *Babesia canis* species (Fig.1 and 2). Haematological analysis revealed that low levels of Hemoglobin indicates anemia which might be due to loss of haemoglobin due to rupture of RBCs in dog. In addition, there is massive reduction in the values of PCV and total RBC count which might be mainly attributed to the reduced RBCs in the blood due to *Babesia canis* [9]. To identify Proper function of the Liver and Kidney during the *Babesia canis* infections, serum SGPT and Creatinine (Table

1). Elevated levels of serum creatinine are the findings in dogs with ARF and babesiosis [10]. In the Present study, normal levels of SGPT were found which might be due to early stages of infection indicates the limited damage to Liver. In the Present study, the affected animals were therapeutically managed with the help of one time blood transfusion as it is emergency to safeguard the life. During the Blood transfusion process, Heart rate and respiration rate were found to be normal. To avoid anaphylactic reactions, Chlorpheniramine maleate at the rate of 2ml and Dexamethasone at the rate of 2 ml was given Intramuscular route.

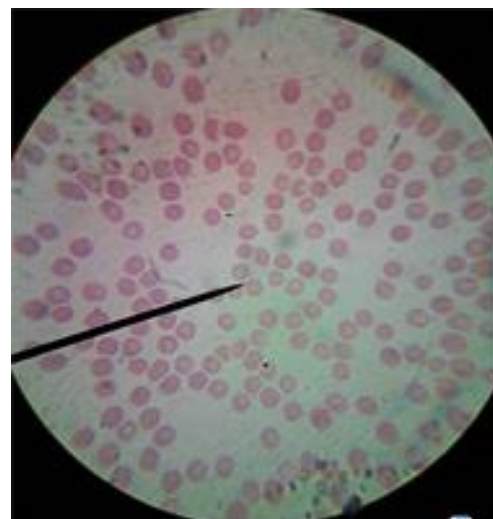


Fig 1: Microscopic picture of *Babesia canis*

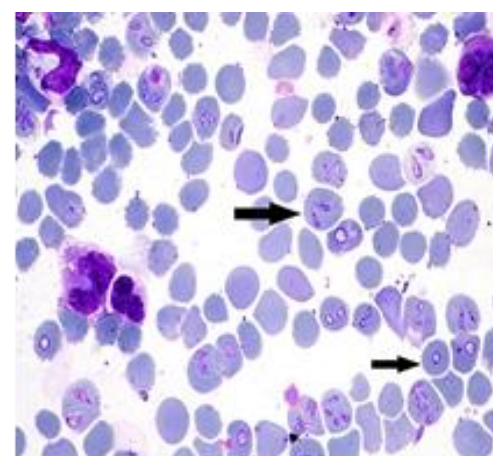


Fig 2: Microscopic picture of *Babesia canis*



Fig 3: Blood Transfusion Bag –CPDA



Fig 4: Crossmatching of donor RBC and recipient Serum indicating no agglutination



Fig 5: Blood transfusion and Mild Fluid Therapy

Table 1: Quantity of Blood Transfused for a Receptient.

Sl. No.	Animal Details	Haematological values	Serum Biochemistry values	Quantity of Blood Transfused	Blood Bag Number
1	German Shepherd, 1.5 Years, Male	Haemoglobin- 3.1g/dl PCV- 13 % RBC-1.49 X 10 ⁹ /μl	Creatinine – 2.5 SGPT- 28 I.U	350 ml	H03170366A
2	Labrador, 5 Years, Female	Haemoglobin- 3.8 g/dl PCV- 15.4 % RBC-2.76 X 10 ⁹ /μl	Creatinine – 3.2 SGPT- 27 I.U	250 ml	H03170366A
3	Great Dane, 4 Years, Female	Haemoglobin- 2.5 g/dl PCV- 12.5 % RBC-3.2 X 10 ⁹ /μl	Creatinine – 4.5 SGPT- 14 I.U	300 ml	H03170366R
4	Labrador, 4 Years, Female	Haemoglobin- 4.0 g/dl PCV- 13.4 % RBC- 4.6 X 10 ⁹ /μl	Creatinine – 4.0 SGPT- 18 I.U	250 ml	H03170366A
5	Golden Retriever, 3 years	Haemoglobin- 3.4 g/dl PCV- 11.5 % RBC- 3.2 X 10 ⁹ /μl	Creatinine – 3.2 SGPT- 26 I.U	250 ml	H03170366A

Treatment

The present study reports the treatment of canine babesiosis includes imidocarb dipropionate at the rate of 6.6 mg /kg B.W Intramuscular, once in a week for two weeks. Imidocarb Dipropionate is the active agent against *B. canis* and it can eliminate *Babesia canis* for upto four weeks following treatment and can prevent infection upto 6 weeks. It however does not clear *B gibsoni* infections but only reduces the mortality and morbidity [11]. The mechanism of Imidocarb includes nucleic acid damage and inhibition of cellular repair and replication [12]. To combat against intracellular organisms in an effective manner, Clindamycin tablets are given at the rate of 10 mg /kg Body weight orally for two weeks [13]. Therapeutic regimen includes (i) fluid replacement by IV infusion of DNS at the rate of 100 ml followed by Ringers lactate (RL) at the rate of 100 ml (Fig.5). As there was already anaemia, to avoid Haemo-dilution, less amount of fluids were given. (ii) furosemide (Inj. Lasix ®) at the rate of 2 mg /kg Body weight Intravenously was given as there is evidence of oliguria in Acute Renal Failure [10]. (iii) Ondansetron at the rate of 0.5 mg /kg Body weight Intravenously to control vomiting. As the general condition of the animal was deteriorating rapidly, Blood was transfused to recipient around 250-350ml. To increase red blood cell production, Erythropoietin injection (EpoFit ®, Intas company) was given at the rate of 100 I.U per kg Body weight intravenously thrice

in a week for 4 weeks, as Erythropoietin injection stimulates division and differentiation of red blood cells [10]. Phosphate binders such as Ipakatine ® Paste 30 gram was given orally twice a day for a month. Dietary protein restriction and use of urinary alkalizers helps in effective supportive therapy to restore normal renal functions.

Conclusion

The Present Research article concluded that Blood Transfusion along with Supportive therapy helps in Therapeutic management of Canine babesiosis associated with Acute Renal Failure in Canines.

Ethical Matters

In the present study the samples of serum and Blood smears are used from the clinical case presented to the hospital, indicating no ethical issue related in this study.

Acknowledgement

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Conflict of interest

All the authors declare that they have no conflict of interest.

References

1. Jain KJ, Lakshmanan B, Syamala K, Praveena JE, Aravindakshan T. High prevalence of small *Babesia* species in canines of Kerala, South India. *Vet World*. 2017; 10(11):1319-1323.
2. Roopesh MP, Placid Souza ED, Mamatha GS. Molecular detection of canine *Babesia* in ticks of Bengaluru, South India. *Journal of Entomology and Zoology Studies*. 2018; 6(5):962-965.
3. Lobetti R. Haematological changes associated with tick-borne diseases. In: 29th World Cong, Greece, 6-9 Oct. WSAVA, 2004.
4. Caccio SM, Antunovic B, Moretti A, Mangili V, Arinculic A, Baric RR *et al*. Molecular characterisation of *Babesia canis* and *Babesia canis vogeli* from naturally infected European dogs. *Veterinary Parasitology*. 2002; 106:285-92.
5. Dagmara W, Łukasz A, Michał B, Paweł Ł, Stanisław W. Utility of urinary markers in the assessment of renal dysfunction in canine babesiosis. *Veterinarian Prax Ausg*. 2017; 45(02):84-88.
6. Keller N, Jacobson LS, Thompson PN, Schoeman JP. Prevalence and risk factors of hypoglycemia in virulent canine babesiosis. *Journal of Veterinary Internal Medicine*. 2004; 18:265-270.
7. Bai L, Goel P, Jhambh R, Preeti. Prevalence of haemoparasitic diseases in dogs in and around Hisar, Haryana. 2019; 7(1):1311-1313.
8. Slatter DH. Textbook of small animal surgery. Edn. 3, Vol. I, Elsevier Health Sciences, 2003.
9. Laia SG, Angel S, Xavier R, Guadalupe M. A Review of Canine Babesiosis: the European Perspective. *Parasites and Vectors*. 2016; 9:336.
10. Shabeeba PM, Shakir SN, Deepu PM. Therapeutic management of acute renal failure associated with Babesiosis in a dog. *The Pharma Innovation Journal*. 2018; 7(7):817-818.
11. Pudney M, Gray JS. Therapeutic efficacy of atovaquone against the bovine intra-erythrocytic parasite, *Babesia divergens*. *J Parasitol*. 1997; 83:307-10.
12. Plumb DC. Plumb's Veterinary Drug Hand book. Edn. 3, Wiley-Blakwell, Ames, 2015, 1296.
13. Baneth G. Antiprotozoal treatment of Canine Babesiosis. *Veterinary Parasitology*. 2018; 254:58-63.