

THERAPEUTIC MANAGEMENT OF HEPATIC FAILURE AND ASCITES IN A *BABESIA GIBSONI* INFECTED LABRADOR RETRIEVER DOG

S. G. Sangeetha, R. Chandrama, P. Preena, K. Priyanka, Y. Ajith and R. Mukherjee

Division of Medicine, Indian Veterinary Research Institute, Izatnagar,
Bareilly, Uttar Pradesh - 243 122

Received: 14-05-2017 Accepted: 25-05-2017

ABSTRACT

A three year old Labrador retriever dog was presented in Referral Veterinary Polyclinic, Indian Veterinary Research Institute (RVP-IVRI), Izatnagar with the history of pyrexia, anorexia, lethargy and ascites. History of tick infestation was reported by owner. Clinical examination revealed pyrexia (105.3°F), hepatomegaly, popliteal lymphadenopathy and splenomegaly. Hemato-biochemical evaluation revealed significant leukocytosis, hypochromic microcytic anaemia, thrombocytopenia, elevated SGPT level, hyperglobulinemia and hypoalbuminemia. Animal was confirmed positive for *Babesia gibsoni* by PCR and was successfully treated using Doxycycline (5mg/kg BID per orally for 21 days), Clindamycin (12 mg/kg IV) and Metronidazole (20 mg/kg IV) for 7 days along with diuretics. Supportive therapy using antacid, antihistamine, anti-inflammatory, hepato-protectant and B complex vitamins were given.

Keywords: Blood smear examination, clinical management, ascites, hepatic failure

Introduction

Babesiosis in canines is a tick borne

disease caused by intra-erythrocytic protozoan parasites. *Babesia canis* and *Babesia gibsoni* are two organisms commonly causing canine babesiosis of which *B. gibsoni* is smaller organism and is usually seen as signet ring shaped structures inside RBC. *B. gibsoni* is an emerging pathogen, mainly transmitted by *Haemaphysalis longicornis* and *Rhipicephalus sanguineus* ticks (Solano-Gallego and Baneth, 2011). In India, the favourable ecological conditions like abundant tick population favours high prevalence of haemoprotozoan infections in canines. *B. gibsoni* is highly pathogenic in canines causing marked anaemia, remittent fever, haemoglobinuria, marked splenomegaly and hepatomegaly. Disease is usually chronic with relapses and remissions resulting in secondary multiple organ failure and complications like acute renal failure, hepatopathy with marked icterus and hypoglycaemia (Keller *et al.*, 2004).

HISTORY AND OBSERVATIONS

A three year old regularly dewormed and vaccinated Labrador retriever dog was presented in RVP-IVRI, Izatnagar with the history of pyrexia, anorexia, lethargy and

ascites since last 15 days. Owner reported a previous history of tick infestation which was cleared by regular use of cypermethrin 1% shampoo. On clinical examination, animal was dull, depressed, lethargic and rectal examination evinced pyrexia (105.3°F). Physical examination revealed popliteal lymphadenopathy, splenomegaly and hepatomegaly. Conjunctival, vaginal and oral mucous membrane were pale. Hemato-biochemical analysis showed hypochromic microcytic anaemia, leukocytosis, lymphocytosis, thrombocytopenia, hyperglobulinemia, hypoalbuminemia and elevated SGPT levels (Table 1). Blood smear examination after Giemsa staining revealed presence of *B. gibsoni* (signet ring shaped) organisms inside RBC which was later confirmed by PCR.

TREATMENT AND DISCUSSION

Treatment was initiated using Doxycycline (5 mg/kg BID per orally for 21 days), Clindamycin (12mg/kg IV) and Metronidazole (20 mg/kg IV) for seven days. Supportive therapy was given using diuretic (Furosemide 4 mg/kg BID IV for three days followed by oral Furosemide - spironolactone combination for 4 days), antihistamine (Pheniramine 1ml IM for 3 days), non-steroidal anti-inflammatory (Meloxicam 0.2 mg/kg IV for 3 days), hepato-protectant (Silybon 10 ml BID for 45 days) and B-complex vitamin (Neurobion forte one tab SID for 14 days). During the course of therapy, the animal was examined for clinical and parasitological improvement. Animal showed significant improvement by two weeks.

Table 1. Hemato-biochemical parameters of the patient (Day 1)

Parameter	Day 1	Reference values	Key findings
RBC count (millions per mm ³)	4.8	5-7.9	
PCV (%)	28.9	35-57	
Haemoglobin(g/dl)	9.8	12-19	
MCV(fL)	60.1	66-77	Hypochromic microcytic anaemia
MCH(pg)	20.3	21-26.2	
MCHC (%)	30.9	32-36.3	
Total WBC count (cells/mm ³)	20.9	5-14.1	Leukocytosis
Neutrophils (%)	73	58-85	
Lymphocytes (%)	27	8-21	Lymphocytosis
Eosinophils (%)	0	0-9	
Platelets (lakhs/mm ³)	1.03	2.1-6.21	Immune mediated thrombocytopenia
Total protein (g/dl)	5.7	5.4-7.5	
Albumin (g/dl)	1.9	2.3-3.1	Hypoalbuminemia
Globulin (g/dl)	3.8	2.4-4.4	Hyperglobulinemia
A:G ratio	0.5	0.6-1.3	
SGPT (IU/L)	112	10-109	Hepatic injury
SGOT (IU/L)	86	1-114	
Creatinine (mg/dl)	0.9	0.5-1.7	
BUN (mg/dl)	12	8-28	

March 2012: Reference ranges, 10th edn. The Merck veterinary Manual



Fig. 1. Pale conjunctival mucous membrane



Fig. 2. Pale oral mucous membrane



Fig. 3. Ascites (Day 1)



Fig. 4. Animal after one week of treatment

Canine babesiosis is caused by intra-erythrocytic protozoan parasites *B. canis* and *B. gibsoni* and transmitted by ticks *H. longicornis* and *R. sanguineus*. *Babesia gibsoni* is small piroplasm, annular or oval in shape and its size is not more than one eighth diameter of host RBC. Clinical signs of *B. gibsoni* infection include fever, weakness, anorexia, prostration, anaemia, jaundice, marked thirst, splenomegaly and hepatomegaly. Ascites complication in this case may be due to hepatic injury. Ascites, hypochoic changes in liver, hepatomegaly and inflammatory changes of liver was evident in many cases and it is important not to neglect babesiosis in differential diagnosis of ascites (Varshney and Haque, 2003).

Anaemia in babesiosis is reported to be mild, normocytic normochromic in beginning which will later become macrocytic hypochromic. Thrombocytopenia is common in canine babesiosis (Conrad *et al.*, 1991). In the present case there was leukocytosis, lymphocytosis and immune mediated thrombocytopenia. Leukocyte abnormalities like leukocytosis or leucopenia, neutrophilia or neutropenia, lymphocytosis and eosinophilia along with increase in serum activity of Aspartate aminotransferase (AST) and Alanine aminotransferase (ALT) are seen in babesiosis (Irwin and Hutchinson, 1991). Blood smear examination, serological tests and molecular techniques can be used in diagnosis of canine babesiosis (Taboada, 2012).

Babesia gibsoni is resistant to traditional therapy with imidocarb dipropionate, which is effective in *B. canis* infections. Similarly, effect of diminazene aceturate, which is effectively used for the treatment of bovine babesiosis, is limited in management

of *B. gibsoni* infection (Mosqueda *et al.*, 2012). There was reports that Atovaquone-Azithromycin combination is effective in case of *B. gibsoni* infection in dogs (Birkenheuer *et al.*, 2004), but it is having high cost. This case was treated with combination therapy of Doxycycline, Metronidazole and Clindamycin. Combination of Doxycycline, Metronidazole and Clindamycin was reported to be effective in treatment of *B. gibsoni* infections (Suzuki *et al.*, 2007). Common complication of canine babesiosis is multi organ failure which can be managed using antioxidants, liver protectants, multivitamin supplements and haematinics (Ajith *et al.*, 2016). Ascites, which was a finding, in this case may be a complication due to hepatic damage.

ACKNOWLEDGEMENT

The authors are thankful to the Director, ICAR-IVRI for providing facilities for conducting this work.

REFERENCES

- Ajith, Y., Nithya, C., Arathy, S., Jeny, G., Meera, K., Shemeema, A., Siji, S.R., Junaid, N. and Tresamol, P.V. 2016. Clinical management of a Labrador retriever dog concurrently infected with *Leptospira interrogans*, *Babesia gibsoni* and *Dirofilaria repens*. *Comp. Clin. Path.* **25**(6): 1325-1330.
- Birkenheuer, A.J., Levy, M.G. and Breitschwerdt, E.B. 2004. Efficacy of combined atovaquone and azithromycin for therapy of chronic *Babesia gibsoni* (Asian genotype) infections in dogs. *J. Vet. Intern. Med.* **18**(4): 494-498.
- Conrad, P., Thomford, J., Yamane, I., Whiting, J., Bosma, L., Uno, T., Holshuh, H.J. and Shelly, S. 1991. Hemolytic anemia caused by *Babesia gibsoni* infection in dogs. *J. Am. Vet. Med. Assoc.* **199**(5): 601-605.
- Irwin, P.J. and Hutchinson, G.W. 1991. Clinical and pathological findings of *Babesia* infection in dogs. *Aust. Vet. J.* **68**(6): 204-209.
- Keller, N., Jacobson, L.S., Nel, M., Clerq, M., Thompson, P.N. and Schoeman, J.P. 2004. Prevalence and risk factors of hypoglycemia in virulent canine babesiosis. *J. Vet. Intern. Med.* **18**(3): 265-270.
- Mosqueda, J., Olvera-Ramirez, A., Aguilar-Tipacamu, G. and Canto, G. 2012. Current advances in detection and treatment of babesiosis. Current medicinal chemistry, *PLoS One.* **19**(10): 1504-1518.
- Solano-Gallego, L. and Baneth, G. 2011. Babesiosis in dogs and cats - expanding parasitological and clinical spectra. *Vet. Parasitol.* **181**(1): 48-60.
- Suzuki, K., Wakabayashi, H., Takahashi, M., Fukushima, K. and Yabuki, A. 2007. A Possible treatment strategy and clinical factors to estimate the treatment response in *Babesia gibsoni* infection. *J. Vet. Med. Sci.* **69**(5): 563-568.
- Taboada, J. 2012. Babesiosis In: Greene, C.E. (Ed.), *Infectious diseases of dog and cat.* 4th ed. WB Saunders, Philadelphia, pp. 771-784.
- Varshney, J.P. and Haque, M. 2003. Ultrasonographic of liver and spleen in canine babesiosis. *Ind. J. Anim. Sci.* **73**: 642-649.

