

---

## THERAPEUTIC MANAGEMENT OF SUBCLINICAL MIXED HAEMOPROTOZOAL INFECTION IN A WORKING DOG - A CASE REPORT

Aneesh A.

*Veterinary Officer, Army Veterinary Hospital, C/O 56 APO*

*\*Corresponding author: aneeshayinippully@gmail.com*

---

### ABSTRACT

A six year old female German shepherd dog was presented to the + for routine monthly clinical examination. The dog was asymptomatic but leukocytosis, neutropenia, lymphocytosis and thrombocytopenia were observed during haematological analysis. PCR analysis of EDTA blood sample was found positive for *Hepatozoon canis* and *Babesia gibsoni*. The dog was treated with triple combination of Clindamycin, Metronidazole and Doxycycline along with pantaprazole and Liv 52 syrup for a period of 21 days. The dog was also given imidocarb dipropionate and papaya leaf extract. The dog had an uneventful recovery.

**Keywords:** German Shepherd, Imidocarb dipropionate, Leukocytosis, Neutropenia, Papaya leaf extract, Thrombocytopenia.

### INTRODUCTION

Tick borne infections are a major health problem among canines in tropical and subtropical regions (Weerathunga *et al.*, 2019). Anaplasmosis, babesiosis, bartoneliosis, ehrlichiosis and hepatozoonosis are the common tick-borne diseases of dogs (Abd Rani *et al.*, 2011). These infections can occur in dogs due to the transmission of haemoparasites by several tick species or by same species (Chomel, 2011). *Babesia canis* and *B. gibsoni* are two Babesia sp. commonly known to infect canines (Sudhakara Reddy *et al.*, 2016). *B. gibsoni* is endemic in Asia and is transmitted by *Rhipicephalus sanguineus* and *Haemophysalis longicornis*. This infection is considered to be moderately pathogenic (Köster *et al.*, 2015). However, the clinical severity of the *B. gibsoni* infection in dogs is age dependent and could be life

threatening with various clinical symptoms (Liu *et al.*, 2019). *Hepatozoon canis* and *H. americanum* are common hepatozad apicomplexan protozoa infecting dogs (Smith, 1996). Canine hepatozoonosis is transmitted by ingestion of *R. sanguineus* tick belonging to family Ixodidae (Thakur *et al.*, 2018). Mixed infections can happen along with hepatozoonosis as single tick may harbour multiple pathogens (Banerjee *et al.*, 2008). Subclinical infections of tick-borne diseases are very common and if undetected can lead to fatality. The present paper communicates the results of a systematic case study of a mixed haemoparasitic infection in a working dog in north east India.

#### CASE HISTORY AND OBSERVATION

A six years old female German shepherd dog was presented to the Veterinary Hospital for routine monthly veterinary examination. The dog was active and alert with a body temperature of 100.2° F, heart rate of 79 beats per minute and respiratory rate of 34 breaths per minute (Fig. 1). The bitch was weighing 39 kgs with pale roseate visible mucus membrane. No abnormality reported in defecation and urination pattern and the dog was eating and drinking normally. Leukocytosis, neutropoenia, lymphocytosis and thrombocytopenia were observed during haematological analysis. Serum



biochemistry revealed hypoalbumineamia, hyperglobulinemia, hypoglycaemia and elevated levels of Serum glutamic pyruvic transaminase, creatinine and cholesterol. The detailed haematological and serum biochemical parameters before, during and after therapy are mentioned in Table.1. Stained peripheral blood smear did not reveal presence of any haemoprotozoan organisms. PCR analysis of EDTA blood sample was found positive for *H. canis* and *B. gibsoni*.

The dog was treated with triple combination of Clindamycin @ 25 mg/kg body weight orally BID, Metronidazole @ 15 mg/kg body weight orally BID and Doxycycline @ 10 mg/kg body weight orally BID (Singh and Faruque, 2019) along with pantaprazole 20 mg orally BID and Liv 52 syrup 5 ml orally BID for a period of 21 days. The dog was also given imidocarb dipropionate @ 6.6 mg/kg body weight IM along with Atropine sulphate premedication @ 0.05mg/kg body weight IM (Vishwakarma and Nandini, 2019) on the first day of presentation. After 21 days

**Table.1: Haematological and serum biochemical parameters**

Parameter	unit	Initial value	After 21 days	After 36 days
Hb	g/dl	16	17.5	14.4
Hct	%	50.6	58	38.1
RBC Count	Millions/mm <sup>3</sup>	6.87	6.9	6.4
MCV	fl	73.7	84	71
MCH	Pg	23.2	25.2	26.8
MCHC	g/dl	31.6	30.1	37.7
WBC Count	Thousands/mm <sup>3</sup>	71.12	10.5	15
Thrombocyte	%	145	2.47	2.2
Neutrophils	%	16.1	30	58
Lymphocytes	%	83.3	59	30
Monocytes	%	0.6	03	4
Eosinophils	%	-	09	-
Basophils	%	-	-	-
BUN	mg%	09	11.5	10.2
Creatinine	mg%	1.76	1.6	1.6
AP	IU/L	65	47	32
SGOT	IU/L	35.6	21.7	27.4
SGPT	IU/L	79.3	55.8	60
Total protein	g%	6.65	6.55	6.23
Albumin	g%	2.5	2.5	2.5
Globulin	g%	4.15	4.05	3.73
A:G ratio		0.6	0.6	0.67

of treatment, the dog was given Papaya leaf extract (Tab. Caprill) 550mg orally BID for 15 days to improve the thrombocyte count. After the treatment protocol, the dog was found negative for both *H. canis* and *B. gibsoni*.

#### TREATMENT AND DISCUSSION

*H. canis* infection in dogs is frequently asymptomatic and concurrent infection are common (Vincent-Johnson, 2003). Haematological examination of hepatozoonosis typically reveals leucocytosis with mature neutrophilia,

but blood smears rarely reveal presence of gamonts (Ewing *et al.*, 2000). A combination therapy of imidocarb dipropionate and tetracyclines were found to be effective against *H. canis* (Tenter and Deplazes, 2006). Fresh Carica papaya leaf extract significantly increased the RBC and platelet counts among murines (Dharmarathna *et al.*, 2013). Carica papaya leaf extract @ 275 mg BID orally for 7 days significantly improved platelet count in a Labrador dog with *B. canis vogeli* infection accompanied by hepato-renal complication (Patel *et al.*, 2019).

Subclinical *B. gibsoni* infections were previously reported in USA and Australia, where they were PCR positive without any clinical illness or presence of organism in the blood smear (MacIntire *et al.*, 2002). Combination therapy of clindamycin, metronidazole and doxycycline is an effective strategy for treatment of *B. gibsoni* (Nandini *et al.*, 2016). Imidocarb dipropionate is recommended for treatment of canine babesiosis and it causes blockage of entry of inositol into erythrocytes containing babesia resulting in starvation of parasite (Mchardy *et al.*, 1986). Elevation of AST, creatinine along with hypoglycaemia and hypoalbuminemia were previously observed in babesiosis (Vishwakarma and Nandini, 2019).

Prevalence of haemoprotozoan infection in north east was 57.31% in the hospital population comprising pet (58.03%) and working (54.54%) dogs and 63.64% in stray dog population, in which a total of 7 species viz. *B. gibsoni* (47.16%), *Ehrlichia (Anaplasma) platys* (8.49%), *Dirofilaria immitis* (2.83%), *E. canis* (2.12%), *B. canis* (1.41%), *H. canis* (1.41%) and *E. ewingii* (0.47%) in single or mixed infections were recorded. *B. gibsoni* was found to be most predominant haemoprotozoan species in this study (Bhattacharjee and Sarmah, 2013). Previous studies have confirmed

the prevalence of *H. canis* in pet and stray dogs from different parts of India (Eljadar Mohamed *et al.*, 2010). *H. canis* was recorded in 6 hospital dogs either in single or mixed infection with *B. gibsoni* (Bhattacharjee and Sarmah, 2013). Current finding of mixed infection in a working dog was in agreement with previous reports of mixed infection of *B. gibsoni* and *H. canis* among dog population of the north east.

### SUMMARY

Six years old working German shepherd dog was diagnosed with a case of mixed subclinical haemoprotozoal infection. The dog was treated with triple combination of clindamycin, metronidazole and doxycycline along with imidocarb dipropionate and papaya leaf extract. The working dog had an uneventful recovery.

### REFERENCES

- Abd Rani, P. A. M., Irwin, P. J., Coleman, G. T., Gatne, M. and Traub. R. J. 2011. A survey of canine tick-borne diseases in India. *Parasites Vectors* **4**: 141-148.
- Banerjee, P. S., Mylonakis, M. E., Garg, R., Vatysa, S. and Yadav, C. L. 2008. Concurrent hepatozoonosis, monocytic and granulocytic ehrlichiosis in a dog. *J. Vet. Parasitol.* **22**:9-11.

- Bhattacharjee, K. and Sarmah, P.C. 2013. Prevalence of haemoparasites in pet, working and stray dogs of Assam and North-East India: A hospital based study, *Vet. World* **6**: 874-878.
- Chomel, B. 2011. Tick-borne infections in dogs-an emerging infectious threat. *Vet. Parasitol.* **179**:294-301.
- Dharmarathna, S.L.C.A., Wickramasinghe, S., Waduge, R. N., Rajapakse, R. P. V. J. and Kularatne, S. A. M. 2013. Does *Carica papaya* leaf-extract increase the platelet count? An experimental study in a murine model. *Asian Pacific J. Tropical biomed.* **3**: 720-724.
- Eljadar Mohamed, S.M., Singla, L. D., Uppal, S. K., Bal, M. S. and Juyal, P.D. 2010. Studies on morphometric variations of haematozoa in dogs. *Proceedings of XX National Congress of Veterinary Parasitology*. Hisar, Haryana.
- Ewing, S, A., Panciera, R. J., Mathew, J.S., Cummings, C. A., Kocan, A. A. 2000. American canine hepatozoonosis -An emerging disease in the New World. *Annals New York Academy Sci.* **916**: 81-92
- Köster, L. S., Lobetti, R. G. and Kelly, P. 2015. Canine babesiosis: a perspective on clinical complications, biomarkers, and treatment. *Vet. Med.: Res. Rep.* **6**: 119-128.
- Liu, I. L., Chi, N. Y., Chang, C. L., Hung, M. L., Chiu, C. T. and Chen, H. W. 2019. A novel PCR-based point-of-care method enables rapid, sensitive and reliable diagnosis of *Babesia gibsoni* infection in dogs. *BMC Vet. Res.* **15**: 1-5.
- MacIntire, D. K., Boudreaux, M. K., West, G. D., Bourne, C., Wright, J. C., Conrad, P. A. 2002. *Babesia gibsoni* infection among dogs in the southeastern United States. *J. Ame. Vet. Med. Assoc.* **220**:325-329.
- McHardy, N., Woollon, R. M., Clampitt, R. B., James, J. A. and Crawley, R. J. 1986. Efficacy, toxicity and metabolism of imidocarb dipropionate in the treatment of *Babesia ovis* infection in sheep. *Res. Vet. Sci.* **41**:14-20.
- Nandini, M. K., Vishwakarma, P. and Kamran, C. A. 2016. New therapeutic protocol for canine babesiosis: A case report. *J. Dairy Vet. Ani. Res.* **3**:112-113.
- Patel, P.K., Patel, S. K., Kumari, P., Garg, R., Saxena, A.C. and Dixit, S. K. 2019. Therapeutic management of *Babesia canis vogeli* infection associated with

- hepato-renal complications in a dog. *J. Entomol. Zool. Studies* **7**: 202-205.
- Singh, S. and Faruque, S. 2019. Prevalence of babesiosis among Army dogs in and around Udhampur in Jammu and Kashmir. *J. Remount Vet. Corps* **58**: 89-98.
- Smith, T.G. 1996. The genus Hepatozoon (Apicomplexa: Adeleina). *J. Parasitol.* **82**: 565–585.
- Sudhakara Reddy, B., Sivajothi, S., Varaprasad Reddy, L. S., & Solmon Raju, K. G. (2016). Clinical and laboratory findings of Babesia infection in dogs. *J. Parasitic diseases* **40**: 268–272.
- Tenter, A. M. and Deplazes, P. 2006. Protozoeninfektionen von Hund und Katze. In Schnieder, T. (ed): *Veterinar-medizinische Parasitologie*. Parey, MVS Medizinverlage Stuttgart GmbH & Co. KG, pp. 409– 443
- Thakur, N., Chethan, G. E., Akhilesh, A. L., Kumari, P., Shehzad, M., Rajesh, J. B., Mahendran, K., De, U. K. and Banerjee, P. S., 2018. Therapeutic management of Hepatozoon canis induced acute hepatitis in a dog. *J. Entomol. Zool. Studies* **6**: 1037-1039.
- Vincent-Johnson, N. A. 2003. American canine hepatozoonosis. *Vet. Clinics North America Small Ani. Pract.* **33**: 905–920
- Vishwakarma, P. and Nandini, M. K. 2019. Overview of Canine Babesiosis. In *Veterinary Medicine and Pharmaceuticals*. Intech Open.
- Weerathunga, D., Amarasinghe, A., Iddawela, D. and Wickramasinghe, S. 2019. Prevalence of canine tick-borne haemoparasites in three Divisional Secretariat Divisions (Rambewa, Tirappane, and Galenbidunuwewa) in the Anuradhapura district, Sri Lanka. *Sri Lankan J. Infe. Dis.* **9**: 111-119.

