



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2019; 7(1): 1519-1520

© 2019 JEZS

Received: 14-11-2018

Accepted: 18-12-2018

**Laxmi Bai**

Department of Veterinary  
Medicine, LLR University of  
Veterinary and Animal Sciences  
Hisar, Haryana, India

**Parveen Goel**

Department of Veterinary  
Medicine, LLR University of  
Veterinary and Animal Sciences  
Hisar, Haryana, India

**Ricky Jhambh**

Department of Veterinary  
Medicine, LLR University of  
Veterinary and Animal Sciences  
Hisar, Haryana, India

**Preeti**

Department of Veterinary Public  
Health, LLR University of  
Veterinary and Animal Sciences,  
Hisar, Haryana, India

**Correspondence**

**Laxmi Bai**

Department of Veterinary  
Medicine, LLR University of  
Veterinary and Animal Sciences  
Hisar, Haryana, India

## Haematobiochemical changes in Dog affected with *Babesia canis*

**Laxmi Bai, Parveen Goel, Ricky Jhambh and Preeti**

**Abstract**

Canine babesiosis is a disease in which erythrocytic cell membrane is damaged resulting into anaemia. Diagnosis of the organism was confirmed by blood smear examination. Normocytic normochromic anaemia was observed in the affected dog. Icterus and hepatic enzyme elevation occurred. Serum biochemical profile revealed lower values of total protein, total bilirubin and increased value of urea and creatinine.

**Keywords:** Urea, anaemia, bilirubin

**Introduction**

Canine babesiosis is a clinically significant and geographically widespread hemoprotozoan disease of dogs <sup>[10]</sup>. *Babesia canis* and *Babesia gibsoni* are the two most commonly occurring species <sup>[4]</sup>. A wide range of clinical signs has been reported in canine babesiosis. Anemia is the predominant clinical syndrome, the development of which is multifactorial and results in both intravascular and extravascular hemolysis. Parasitic activity directly damages the erythrocyte cell membrane, resulting in increased osmotic fragility and subsequent intravascular hemolysis <sup>[6]</sup>. Icterus and elevated hepatic enzymes occur frequently. Although the associated hemolytic anemia contributes to hyperbilirubinemia, it is not the sole cause.

Direct microscopic examination of the stained blood smear is the most commonly used method as far as the diagnosis of canine babesiosis is concerned as it is conclusive, feasible, and cost effective diagnostic method <sup>[2]</sup>. Regarding the Indian scenario, the true status of canine babesiosis is still not clear <sup>[7]</sup>. The present study was carried out for the haematobiochemical alterations in affected dogs.

**Materials and Methods**

Thin blood smears from the micro-capillary circulation (ear tip) in duplicate from each suspected cases were prepared on clean, grease free microslides, air dried and fixed using methanol. The fixed blood smears were stained by Giemsa stain using 1:10 dilution for 30 – 40 minutes (Coles, 1986). The slides were washed under running tap water, air dried and examined microscopically at 1000 times magnification under oil immersion for haemoparasites. A total of 105 blood smears were examined from canines presented at TVCC, LUVAS, Hisar, Haryana during April to December 2016. Diagnosis was made on the basis of blood smear examination <sup>[1]</sup>.

The blood sample collected in tubes coated with K<sub>3</sub>EDTA was immediately analyzed for complete hematological examination using fully automated Hematology cell counter (MS4s, Melet Schlosing Lab.). The serum sample was analyzed for estimation of biochemical profile using fully automated random access clinical chemistry analyzer (EM Destiny 180, Erba Diagnostics Mannheim GmbH).

**Results and Discussion**

Haematological examination revealed higher lymphocytes, monocytes and eosinophils count and lower thrombocytes count and mean platelet volume in the affected dog than that of the normal reference range with the rest of the parameters within normal range. This was in accordance with the workers <sup>[5]</sup>. Normocytic normochromic anemia was in agreement with the workers <sup>[9]</sup>.

Serum biochemical profile revealed a lower total protein, albumin, Albumin/Globulin ratio and

total bilirubin levels in contrary to [9] who reported no alteration in these values while these were in accordance with [12, 11]. Higher triglycerides, urea, creatinine and alkaline phosphatase (ALP) levels in affected dog were observed. Increased urea and creatinine levels were in accordance with [8]. Increase in level of ALP was may be due to damage or

abnormal function of the biliary system [3]. This might be due to involvement of liver or kidney. These changes may be due to hepatopathy and immune haemolytic anaemia caused by the organism [4]. All the haematological and serum biochemical parameters are depicted in table 1.

**Table 1:** Hematological, thrombocytic and serum biochemical parameters

Serum biochemical parameter	Dog affected with <i>Babesia canis</i>	Parameters	Dog affected with <i>Babesia canis</i>
ALT (U/L)	15.4	Hb (g/dl)	9.7
AST (U/L)	19.7	TEC (M/mm <sup>3</sup> )	4.81
GGT (U/L)	6.4	Hct (%)	30.1
Bilirubin total (mg/dl)	0.82	MCV (fl)	62.57
Bilirubin direct (mg/dl)	0.32	MCHC (g/dl)	32.22
Bilirubin indirect (mg/dl)	0.50	MCH (pg)	20.1
Alkaline phosphatase (U/L)	245	TLC (m/mm <sup>3</sup> )	10.71
Total Protein (g/dl)	4.89	L (%)	37.2
Albumin (g/dl)	1.28	N (%)	53.3
Globulin (g/dl)	3.61	M (%)	5.9
A/G ratio	0.35	E (%)	3.2
Triglycerides (mg/dl)	230	B (%)	0.4
Total cholesterol (mg/dl)	266	Thrombocytes (m/mm <sup>3</sup> )	247
Urea (mg/dl)	97.1	MPV (fl)	7.12
Creatinine (mg/dl)	12.82	Pct (%)	0.22

## Conclusion

Haematological findings revealed increased lymphocytes, monocytes and normocytic normochromic anaemia. Increased alkaline phosphatase, urea and creatinine values shows liver and kidney involvement in *Babesia canis* affected dog.

## References

- Bai L, Goel P, Jhambh R, Preeti. Prevalence of haemoparasitic diseases in dogs in and around Hisar, Haryana. 2019; 7(1):1311-1313.
- Caccio SM, Antunovic B, Moretti A, Mangili V, Arinculic A, Baric RR *et al.* Molecular characterisation of *Babesia canis canis* and *Babesia canis vogeli* from naturally infected European dogs. *Veterinary Parasitology*. 2002; 106:285-92
- Crnogaj M, Petlevski R, Mrljak V, Kis I, Torti M, Kucer N *et al.* Malondialdehyde levels in serum of dogs infected with *Babesia canis*. *Veterinary Medicine*. 2010; 55(4):163- 171.
- Jacobson LS, Lobetti RG. Rhabdomyolysis as a complication of canine babesiosis. *Journal of small animal practice*. 1996; 37:286-297.
- Latimer KS, Prasse KW. Duncan and Prasse's veterinary laboratory medicine: clinical pathology, 2003.
- Lobetti R. Hematological changes associated with tick-borne diseases. In: 29th World Cong, Greece, 6-9 Oct. WSAVA, 2004.
- Makinde MO, Bobade PA. Osmotic fragility of erythrocytes in clinically normal dogs and dogs with parasites. *Research in Veterinary Science*. 1994; 57:543-548.
- Pawar SD, Gatne ML. Some haematological and biochemical profiles in canine hepatozoonosis. *Journal of Veterinary Parasitology*. 2005; 19(2):171-172.
- Reddy BS, Sivajothi S, Reddy LSS, Raju KGS. Clinical and laboratory findings of *Babesia* infection in dogs. *Journal of Parasitic Diseases*. 2014; 92:268-272.
- Shah SA, Sood N, Tumati SR. Haemato-biochemical changes in natural cases of canine babesiosis. *Asian Journal of Animal Sciences*. 2011; 5(6):387-392
- Taboada J, Merchant SR. Babesiosis of companion animals and man. *Vet. Clinics of North American Small Animal Practice*. 1991; 21:103-123.
- Vijayalakshmi P, Srinivasan SR, Vairamuthu S, Mangalagowri A, Latha BR, Nambi AP. Clinico Pathological Features in Dogs Associated with Babesiosis. *Indian Veterinary Journal*. 2014; 91(04):21-24.
- Yadav R, Gattani A, Gupta SR, Sharma CS. Jaundice in dog associated with babesiosis - A case report. *International Journal of Agro Vet. Med. Sci*. 2011; 5(1):3-6.