

# THERAPEUTIC EFFICACY OF DOXYCYCLIN ON CANINE HEPATOZOONOSIS: A CASE STUDY

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The present study represents the therapeutic efficacy of doxycycline on canine hepatozoonosis which is a vector-borne haemoprotozoan disease caused by *Hepatozoon canis*, transmitted by *Rhipicephalus sanguineus* bite, the brown dog tick. A 3 years old male Labrador weighing 24 kg was presented at TVCC, Belgachia, W.B.U.A.F.S, Kolkata (West Bengal). Physical examination revealed mild dehydration, pale mucous membrane, depression/lethargy, enlarged peripheral lymph node and discolouration of muzzle, surrounded area of eye and scrotum. On clinical examination, the dog showed fever, increased respiratory rate and tachycardia with the history of ectoparasitic infestation. On blood smear examination, gamonts of *Hepatozoon canis* organisms were noticed in neutrophils. Based on these observations the case was diagnosed as canine hepatozoonosis and treated with Doxycycline @ 10 mg/kg b.wt. orally daily for 21 days along with other supportive therapy tick remover, haematinic and hepatoprotectant. Uneventful recovery was noticed after 21 days of treatment.

**Keywords:** Dog, *H. Canis*, Doxycycline.

Canine hepatozoonosis is a vector-borne disease of dogs caused by hemoprotozoan organisms of the genus *Hepatozoon* (phylum Apicomplexa: Adeleorina) transmitted by ingestion of *Rhipicephalus sanguineus* tick belonging to family Ixodidae.—The infections have also been reported from parts of Indian subcontinent (Pawar *et al.*, 2012, Rani *et al.*, 2011, Ingole *et al.*, 2011). Canine hepatozoonosis caused by *H. canis* was first reported from India by James (1905). Canine hepatozoonosis has generally been characterised as a subclinical infection which may remain unnoticed unless concurrent infection with other pathogens is present. Present study depicts the therapeutic efficacy of doxycycline against *Hepatozoon canis* infection.

## Materials and Methods

A 3 years old male labrador having 24 kg body weight was presented at TVCC, Belgachia, W.B.U.A.F.S, Kolkata (West Bengal). It is possible to find out by physical examination there were mild dehydration, pale mucous membrane, depression/lethargy, enlarged peripheral lymph node and discolouration of muzzle, around of eye and scrotum [Fig. 1]. On clinical examination the dog revealed 103°F body temperature,

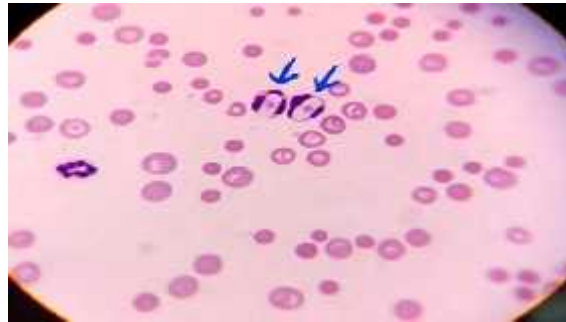
increased respiratory rate and tachycardia with the history of ectoparasitic infestation. On the basis of history and clinical signs the case was suspected for haemoprotozoan infection and for confirmatory diagnosis, blood was prepared, stained with Giemsa staining and examined under oil immersion objectives. Haematological parameters (haemoglobin, packed cell volume, total erythrocyte count, total leucocyte count, differential leucocyte count and platelet count) were estimated from blood collected in EDTA vial and serum biochemical parameters like blood urea nitrogen, creatinine, Alanine trasaminase (ALT), Aspartate aminotrasferase (AST), Alkaline phosphatase (ALP) and total protein were estimated using standard kit as per manufacturers instruction.

On blood smear examination, gamonts of *Hepatozoon canis* were observed in neutrophils and infection was confirmed as canine hepatozoonosis (Fig 2). A complete blood count (CBC) revealed leukocytosis with 86% Neutrophil, Monocyte 3%, Lymphocytes 12%, moderate anemia and mild thrombocytopenia (Table 1). There were abnormalities in biochemical profile also including increased ALP(162), ALT(28),

AST(46), BUN(27.4), creatinine(1.9) and total protein (11.93)(Table1).



**Fig 1: Discolouration of (a) Surrounding area of eye, (b) Muzzle and (c) Scrotum**



**Fig 2: Presence of *H. canis* gamonts within neutrophils represented by blue arrow**

**TABLE 1. VALUES OF THE HAEMATO-BIOCHEMICAL PARAMETERS OBSERVED ON 21<sup>ST</sup> DAY IN A DOG INFECTED WITH HEPATOZOON CANIS:**

Parameters	Finding values on 21 <sup>st</sup> day	Normal values
Haemoglobin (gm/dL)	10.5	12-18
TEC ( $\times 10^6 / \mu\text{L}$ )	4.2	6-8
TLC ( $\times 10^3 / \mu\text{L}$ )	21	6-17
Neutrophil (%)	86	65-70
Eosinophil (%)	03	2-5
Besophil (%)	00	0-1
Lymphocyte (%)	12	20-25
Monocyte (%)	03	2-6
PCV (%)	27	37-55
Platelets ( $\times 10^3 / \mu\text{L}$ )	195	200-500
BUN (mg/dL)	27.4	4-27
Creatinine (mg/dL)	1.9	0.5-1.5
ALT (U/L)	28	4.8-24
AST (U/L)	46	10-40
ALP (U/L)	162	20-156
Total protein(g/dL)	11.93	5.4-7

\* Reference values according to Rizzi *et al.*, 2010, and Halder and Gupta, 2022.

For medical intervention doxycycline @10mg/kg b.wt. orally daily for 21 days was given with other supportive therapy likes tick removal shampoo for bathing, haematinic @10ml daily orally and hepatoprotectant @1 tablet orally daily for 4 weeks.

### Results and Discussion

After three weeks of treatment, the dog appeared normal in health, a blood smear and blood sample were sent for examination again. The report of blood smear examination showed negative result for haemoprotozoa and the haemato-biochemical report also improved than earlier.

Clinical manifestations like fever, anorexia, lymphadenopathy and anemia observed in the present case study were in agreement with earlier reports of Baneth (2006) and Pasa *et al.* (2009). Low values of hemoglobin and PCV, thrombocytopenia, leukocytosis and neutrophilia with elevated blood urea nitrogen (BUN), creatinine and liver enzymes were suggestive of *H.canis* and are in agreement with Sarma *et al.* (2012). Doxycycline is the drug of choice for treatment of hepatozoonosis in canines. Complete recovery with negative blood smear examination on 21st day after treatment was indicative of its efficacy in the present case. It has been concluded that doxycycline along with supportive therapy (haematinic, tick remover and hepatoprotectant) might be useful choice for proper management of hepatozoonosis induced acute hepatitis in dogs.

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