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Therapeutic management of canine hepatozoonosis in dog with combined therapy of doxycycline and clindamycin

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Abstract

A 3-year old German shepherd dogs was presented to Dr. I P Singh veterinary clinical complex and trauma centre Pantnagar with a history of reduced appetite, lethargy, decreasing body condition and tick infestation. Upon clinical examination it was found that dog was having fever, enlarged lymph nodes and anaemia. Finding of hematobiochemical examination revealed, leucocytosis, neutrophilia, thrombocytopenia and increased level of liver enzymes. Findings of blood smear examination demonstrated presence of gamonts of *Hepatozoon canis* in neutrophils. Based on these observations dog was diagnosed for hepatozoonosis. The dog was treated with combination therapy of doxycycline and clindamycin and a good recovery was seen after 28 days of treatment.

Keywords: German shepherd, canine hepatozoonosis, *Hepatozoon canis*

Introduction

Hepatozoonosis is a widespread tick-borne infection that has been documented in dogs and cats from all over the world (Kolangath *et al.*, 2022) [5]. In dogs the infection mainly occurs due to two species namely *Hepatozoon canis* and *Hepatozoon americanum*. In India, the infection is mainly reported due to *Hepatozoon canis* and was firstly documented in 1905 (James 1905) [4]. In dogs, *Hepatozoon canis* is usually transmitted by brown dog tick namely *Rhipicephalus sanguineus*. Infection with *H. canis* can range from subclinical in otherwise healthy dogs to severe and life-threatening in animals with extreme lethargy, fever, and anaemia (Baneth, 2011) [2]. Clinical signs such as muscle pain, ataxia difficulty in swallowing, circling movements were also reported in immunocompromised dogs (Attapatu *et al.*, 2017) [1]. Diagnosis of the infection can be done by the presence of capsule-like gamonts in the cytoplasm of neutrophils in blood smear. Other diagnostic procedures includes polymerase chain reaction (PCR) DNA or enzyme linked immunosorbent assay (ELISA) (Sakuma *et al.*, 2009) [11]. The present study documents a case of acute hepatozoonosis in a dog and its therapeutic management.

Case presentation

A 3-year old German shepherd dogs was presented to Dr. I P Singh veterinary clinical complex and trauma centre Pantnagar with a history of reduced appetite, lethargy, decreasing body condition and tick infestation. Upon clinical examination it was found that dog was having enlarged submandibular lymph node and pale mucous membrane. Urine was dark yellow and defecation was normal. Rectal temperature of dog was 103.6 F. Finding of hematobiochemical examination revealed anaemia, leucocytosis, neutrophilia, thrombocytopenia and increased level of alanine amino transferase, alkaline phosphatase blood urea nitrogen (Table 1). Findings of blood smear examination demonstrated gamonts of *Hepatozoon canis* in neutrophils under microscope (Fig 1). Based on these observations dog was diagnosed for hepatozoonosis.



Fig 1: Gamonts of *Hepatozoon canis* under microscope



Fig 2: German shepherd dog affected with canine hepatozoonosis

Table 1: Haemato-biochemical alteration in blood profile of dog both before and after treatment

Blood Parameter	Before treatment	After treatment	Reference value
Haemoglobin (g/dl)	9.3	11.68	12-18
PCV (%)	34.8	38.47	37-55
TEC ($10^6/\mu\text{l}$)	5.15	6.73	5.5-8.8
TLC ($10^3/\mu\text{l}$)	20.49	10.46	6-17
Neutrophils (%)	81	65	60-76
Lymphocytes (%)	15	28	12-30
Eosinophils (%)	3	3	2-10
Monocytes (%)	1	2	3-10
Thrombocytes thou/mm ³	112	256	200-500
Total bilirubin mg/dl	0.36	0.2	0-0.3
ALT U/L	159	86	10-109
AST U/L	58	42	9-49
ALP U/L	198	124	21-170
Total Protein g/dL	5.12	5.5	5.4-7.5
Albumin g/dL	1.8	2.8	2.3-3.1
Globulin g/dL	3.32	1.9	2.4-4.1
A: G	0.54	1.4	0.6-1.3
Creatinine mg/dl	1.6	1.1	0.5-1.7

Treatment and Discussion

The treatment was started with injections of Doxycycline @ 5 mg/kg IV BID, infusions of NSS @ 250ml IV, injections of B complex @ 2 ml IV, injection Pantoprazole @ 1 mg/kg BW IV for 3 days. The appetite of dog improved significantly on the 3rd day of treatment. Tab Doxycycline @ 5 mg/kg PO BID and Tab clindamycin @ 10mg/kg B. W. PO BID were continued as the main therapy of infection for 28 days. Along with this haematinic (hepatoglobine syrup @ 1tsp PO BID daily) and liver syrup (silymarin syrup @ 2 tsp PO BID daily) were given for 28 days. Supportive therapy included injection Meloxicam @ 0.2 mg/kg B.W. IM OD for 3days, infusion NSS @ 15 ml / kg B.W. IV for 3 days, injection aciloc @ .5 mg/ kg B.W. IM OD for 3 days for management of fever. The dog showed satisfactory recovery and temperature was normal from 4th day of treatment. Blood smear was negative for *Hepatozoon canis* and hematobiochemical parameters were normal by 28 days of treatment.

Canine hepatozoonosis is a prevalent disease in dogs (Patidar *et al.*, 2022) [9]. Dogs with canine hepatozoonosis usually manifests a variety of clinical signs which includes fever, anorexia, lymphadenopathy weight loss, pale mucous membrane (Roopali *et al.*, 2017) [10]. Similar clinical signs

were observed in this study. Changes in blood profile including decrease in haemoglobin, neutrophilia and leucocytosis might be due to inflammatory response to *Hepatozoon canis* (Attapatu *et al.*, 2017; Roopali *et al.*, 2017) [1, 10]. Hepatozoonosis is often described as an infection that affects the liver. (Thakhur *et al.*, 2018; Pasa *et al.*, 2009) [12, 8] Thus damage of liver might be a reason of increase in liver enzymes such as alanine amino transferase, alkaline phosphatase and decrease in level of albumin in blood. Increase in BUN and creatinine might be due to affection of kidney by *Hepatozoon canis* as it causes glomerulonephritis (Harikrishnan *et al.*, 2008) [3]. Findings of haematology and biochemistry are similar to previous studies by (Thakhur *et al.*, 2018; Mondal *et al.*, 2021) [12, 7]. The treatment plan implemented in this study involved the administration of two primary drugs, Tab. Doxycycline and Tab clindamycin, to combat the *Hepatozoon canis* infection. Doxycycline is drug of choice in treating *Hepatozoon canis* infection in dogs (Kumar *et al.*, 2012) [6]. Doxycycline was found effective when used in combination with clindamycin in dogs affected with *Hepatozoon canis* (Sakuma *et al.*, 2009) [11]. Similar finding was also observed in this study. In other studies drug like imidocarb dipropionate was when used in combination with doxycycline was found effective

in treatment for hepatozoonosis in dogs (Thakur *et al.*, 2018; Mondal *et al.*, 2021) [12, 7].

Conclusion

The comprehensive treatment approach employed in this study demonstrated positive outcomes in managing canine hepatozoonosis, addressing the clinical signs and abnormal blood parameters associated with the disease. The combination of doxycycline and clindamycin, along with supportive therapy and supplements, proved effective in achieving satisfactory recovery for the affected dogs. Since the infection targets liver supplementation of liver protectives and haematinics is must as a supportive therapy in dogs. These findings align with previous research in this area and contribute to the body of knowledge on the management of canine hepatozoonosis.

References

1. Atapattu U, Dissanayake DA, Silva ID, Bulumulla DGSS, Neelwala NGDAK, Wijekoon T. Acute hepatozoonosis caused by *Hepatozoon canis* in dogs in Sri Lanka. Sri Lanka Veterinary Journal. 2017;64(1A):19. DOI: 10.4038/slvj.v64i1A.19
2. Baneth G. Perspectives on canine and feline hepatozoonosis. Vet Parasitol. 2011;181(1):3-11. <https://doi.org/10.1016/j.vetpar.2011.04.015>
3. Harikrishnan TJ, Pazhanivel N, Chellappa DJ. Observations on the development of *Hepatozoon canis* in a dog. J Vet Parasitol. 2008;22(1):35-40.
4. James SP. On a parasite found in white corpuscles of the blood of dogs. Sci Mem Off Med Sanit Dep Gov India. 1905;14:1-12.
5. Kolangath SM, Upadhye SV, Dhoot VM, Pawshe MD, Shalini AS, Kolangath RM. Molecular investigation and clinical management of *Hepatozoon canis* infection in an Indian jackal—a case report. BMC Vet Res. 2022;18(1):1-8. <https://doi.org/10.1186/s12917-022-03213-8>
6. Kumar T, Arora N, Rajora VS. Hepatozoonosis and its therapeutic management in a dog. Intas Polivet. 2012;13(1):138-139.
7. Mondal M, Maity A, Mandal D, Jana PS, Roy M, Pakhira MC, *et al.* Diagnosis and Therapeutic Management of Hepatozoonosis in Dog. Int J Curr Microbiol App Sci. 2021;10(08):550-555. <https://doi.org/10.20546/ijcmas.2021.1008.065>
8. Paşa S, Kiral F, Karagenc T, Atasoy A, Seyrek K. Description of dogs naturally infected with *Hepatozoon canis* in the Aegean region of Turkey. Turk J Vet Anim Sci. 2009;33(4):289-295. DOI: 10.3906/vet-0801-11
9. Patidar S, Vatsya S, Kumar RR, Kumar N, Kalita JC, Jakhar J. Management of canine hepatozoonosis with combined therapy of imidocarb and doxycycline: A case report. Pharma Innovation J. 2022;SP-11(7):1555-1557.
10. Roopali B, Mahadappa P, Satheesha SP, Sandeep H, Kasaralikal V, Patil NA. Acute hepatozoonosis in dogs: a case report. J Parasit Dis. 2017;41(3):747-749. <https://doi.org/10.1007/s12639-017-0882-x>
11. Sakuma M, Nakahara Y, Suzuki H, Uchimura M, Sekiya Z, Setoguchi A, *et al.* A case report: a dog with acute onset of *Hepatozoon canis* infection. J Vet Med Sci. 2009;71(6):835-838. <https://doi.org/10.1292/jvms.71.835>

12. Thakur N, Chethan GE, Akhilesh AL, Kumari P, Shehzad M, Rajesh JB, *et al.* Therapeutic management of *Hepatozoon canis* induced acute hepatitis in a dog. J Entomol Zool Stud. 2018;8(12.1):12-19.