

Successful management of hepatozoonosis in a tiger cub (*Panthera tigris*)

A.S. Shalini^{1*}, V.M. Dhoot¹, S.V. Upadhye¹, M.D Pawshe¹ and S.M. Kolangath¹

Wildlife Research and Training Centre, Gorewada, Nagpur

Abstract

A five month old male tiger with heavy tick infestation was captured from Khutwanda Beat, Katoda round, Tadoba range, TATR core with clinical signs of dehydration and anaemia. The cub after preliminary treatment at Transit treatment centre, Chandrapur and was shifted to Gorewada Rescue centre, Nagpur where it was noticed that the cub had mild abnormal distension of abdomen and had a stunted growth. The cub was isolated and was screened for the presence of blood parasites. Physical examination was done and all the vital parameters viz. HR, RR, Temperature etc. was within normal ranges. Haematology revealed monocytosis with severe leukocytosis. Some Sero-biochemical parameters were at higher side. On the basis of hemato-biochemical changes and blood smear examination, it was confirmed to be case of hepatozoon spp. infection. The present case study represents the effect of therapy with Oxytetracycline against Hepatozoon spp. infection

Key words: Hepatozoonosis, Tiger cub, *Panthera tigris*

Hepatozoon species is an epicomplexan parasite of family Hepatozoidae affecting primarily mammalian leukocytes (Baneth, 2001). Unlike most tick-borne diseases, hepatozoonosis is not transmitted through a tick bite but through ingesting an infected tick. Transmission of disease takes place by ingestion of *Rhipicephalus sanguineus* tick belonging to family Ixodidae. However, meat eating, hunting and transplacental transmission is also reported. Mixed infections are possible with hepatozoonosis as single tick may harbor multiple pathogens (Banerjee, 2008). Hepatozoon species in felines were first described by Patton (1908) in India. Since then, hepatozoon species infection have occasionally been reported as gametocytic or schizogonic development in domestic and wild felids (Kubo *et al.*, 2010). *Hepatozoon canis* primarily affects the haemolymphatic tissue and blood cell forming organs such as the bone marrow, spleen and lymph nodes. Animals with severe clinical conditions show signs like fever, loss of appetite, weight loss, hyperglobulinaemia often resulting in hepatitis, anaemia, glomerulonephritis and pneumonia. Co-infection of Hepatozoon spp. with other blood parasites such as Ehrlichia, Leishmania is a common condition (Baneth and Weigler, 1997). The diagnosis of hepatozoonosis is made by observation of gamonts in blood smears, histopathology, PCR or serology. In India, very limited work on hepatozoonosis of wild felines have been reported. Herein, we present a case of hepatozoonosis in a tiger cub and its successful management.

Case history and Observation

A male tiger cub about 8-9 months was brought from Khutwanda Beat, Katoda round, Tadoba range, TATR core to Wildlife research and Training Centre, Gorewada, Nagpur with the signs of mild abdominal distension, stunted growth and with the history of treatment for anaemia, dehydration, and heavy tick infestation. The cub was isolated and detailed clinical examination was done which revealed that the vital parameters viz. HR, RR, Temperature were within normal limits. The urine pH was found to be acidic. Haemato-biochemistry showed leucocytosis with monocytosis and mildly elevated ALT and AST. Blood smear examination revealed gamonts in neutrophils (Fig.1). On the basis of haemato-biochemistry and blood smear examination, it was confirmed to be a rare case of hepatozoonosis in a tiger cub.

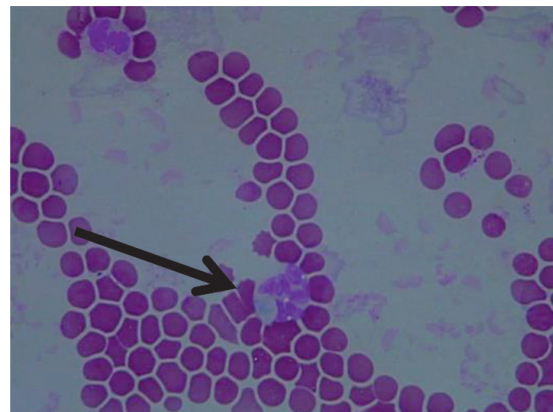


Fig. 1: Arrow showing gamonts of Hepatozoon sp. in a neutrophils from peripheral blood smear stained with Giemsa (100x).

*Corresponding author: a.sshalini@yahoo.com

Table 1. Haemato-biochemical changes in hepatozoonosis of tiger cub recorded during pre and post treatment

Sr. No.	Hematology			Sr. No.	Serum biochemistry		
	Parameters	0 th day	30 th day		Parameters	0 th day	30 th day
1	Haemoglobin(g/dl)	10.3	11.3	1	BUN (mg/dl)	25	31.7
2	RBC ((10 ⁶ /cu.mm)	6.02	6.58	2	Creatinine (mg/dl)	0.9	1.5
3	PCV (%)	37.9	41.6	3	Total protein (gm/dl)	7.8	6.8
4	Platelets (10 ³ /mm ³)	364	79	4	Albumin(g/dl)	4.3	3.0
5	WBC (10 ³ /cu.mm)	26.09	5.5	5	Globulin(g/dl)	3.6	3.8
6	L (%)	18.6	21.5	6	Sodium (mmol/l)	143	147
7	N (%)	70.6	76.8	7	Potassium (mmol/l)	4.2	4.0
8	M (%)	7.6	1.7	8	SGPT (IU/L)	112	20.2
9	E (%)	2.9	2.0	9	SGOT (IU/L)	86	14.7
10	B (%)	0.2	0	10	SAP(IU/L)	63	37.4
				11	Calcium (mg/dl)	11	9.1

Treatment and Discussion

The tiger cub was treated with Oxytetracycline @ 5mg/kg b.wt bid given intravenously with Normal saline along with Tab. Silybon (Silymarin) @ 20mg/kg/day given per-orally. Multivitamin combination containing Vitamin B complex and Vitamin C was also given per-orally. The peripheral blood smear was evaluated on weekly basis and treatment was continued for 30 days till recovery. Haemato-biochemical changes were recorded during and after the treatment which is shown in Table 1.

In order to ascertain that there were no relapses, the peripheral blood smear was evaluated on monthly basis for nine months after recovery and it was found to be negative for hepatozoonosis.

Most commonly hepatozoonosis occurs in subclinical form, though age related acute or chronic form has been reported in young animals due to underdeveloped immune system (Cummings *et al.*, 2005). Leukocytosis with monocytosis and mild elevated levels of liver specific enzymes are may be due to chronic inflammatory response to Hepatozoan infection.

Successful treatment of hepatozoan spp in dogs with combination therapy including doxycycline and oxytetracycline has been reported by Sarma *et al.*, 2012 . It has been reported that imidocarb dipropionate fails to eliminate H. canis infection when given as a sole therapy by Baneth *et al.* 2011. Imidocarb dipropionate was once considered as a drug of choice for canine hepatozoonosis, but recent reports suggest a failure of combination therapy of imidocarb dipropionate and toltazuril/emodepside

plus clindamycin in treatment of Hepatozoon canis infection (Thakur *et al.*, 2018). Also, combination therapy containing pyrimethamine, sulfadiazine/trimethoprim and clindamycin followed by long term therapy with decoquinqte has been recommended by Allen, 2022. However, the therapy was not suitable in this case as sulphadiazine/trimethoprim requires alkaline pH of urine for the drug excretion. In the present case, therapy with Oxytetracycline and supportive therapy with Silymarin for treatment of hepatozoonosis in tiger cub resulted in elimination of infection.

Acknowledgement

The authors are grateful to Forest Development Corporation of Maharashtra Ltd., for providing necessary facilities to carry out this case study and Principle Chief Conservator of Forest (Wildlife), Maharashtra State for granting necessary permission for publication.

References

- Allen, K.E. 2022. Old World Hepatozoonosis and American Canine Hepatozoonosis. <https://www.msdsvetmanual.com/circulatory-system/blood-parasites/old-world-hepatozoonosis-and-american-canine-hepatozoonosis>
- 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.
- Baneth G and Weigler B. 1997. Retrospective case control study of hepatozoonosis in dogs in Israel. *J. Vet. Intern. Med.* **11**: 365-370
- Baneth, G.A.D., Samish, M., Alekseev, E., Aroch, I., Shkap, V. 2001.

- Transmission of *Hepatozoon canis* to dogs by naturally fed or percutaneously-injected *Rhipicephalus sanguineus* ticks. *J. Parasitol.*; **87(3)**:606-611
- Cummings C.A., Panciera R.J., Kocan K.M., Mathew J.S. and Ewing S.A. 2005. Characterization of stages of *Hepatozoon americanum* and of parasitized canine host cells. *Veterinary Pathology.* **42**:788-796
- Kubo Masahito, Arum Jeong, Sang-In Kim, Young-In Kim, Hang lee, Junpei, Takeshi Agatsuma, Hiroki Sakai and Tokuma Yanai. 2010. The first report of *hepatozoon* species infection in leopard cats (*Prionailurus bengalensis*) in Korea. *J. Parasitol.*, **96(2)**: 437-439
- Patton, W. S. 1908. The haemogregarines of mammals and reptiles. *Parasitology*; **1**:318-21.
- Sarma K., Mondal D.B., Saravanan M., Kumar M. and Mahendran K. 2012. Haemato-biochemical changes in *Hepatozoon canis* infected dog before and after therapeutic management. *J. Vet. Parasitol.*; **26(1)**:35-38.
- Thakur Neeraj, Chethan, G. E., Akhilesh, Aishwarya Lekshman, Priyanka Kumari, Munazah Shehzad, 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. Stud.*; **6(4)**: 1037-1039

Received : 28.12.2022

Accepted : 30.05.2023