HOOKWORM INFECTION IN A DOG – A CASE REPORT

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SUMMARY

A seven month old male Labrador dog was presented in the Veterinary Clinical Complex of the Apollo College of Veterinary Medicine with history of anorexia, hematemesis and melena with no foul smell since 5 days and no history of deworming was there. Blood smear was made aseptically from ear tip and was subjected for Giemsa staining to rule out any hemo-protozoan present in the animal. Fecal sample was collected for microscopic examination (Flotation technique) which revealed oval, thin-shelled eggs with 8-16 embryonated cells of *Ancylostoma caninum*. Treatment was started with tablet containing Praziquantel 50 mg, Pyrantel pamoate 144 mg and Fenbendazole 500 mg, Inj. Dexamethasone along with supportive therapy.

Keywords: Ancylostoma caninum, Labrador, Flotation technique

The dog hookworm, Ancylostoma caninum is a blood-feeding intestinal parasitic nematode and can cause zoonotic ancylostomiasis in almost all mammalian hosts including humans (Bowman et al., 2010). Adult hookworm parasitizes in the intestines of dogs and shed millions of eggs to the environment through feces. In dogs, A. caninum is regarded as a leading cause of acute, potentially fatal hemorrhagic enteritis in young puppies (Mulinge et al., 2020). Hookworms have heads that "hook" into the small intestine, where they begin to eat away the tissue and suck blood. This parasite has been called a "voracious blood sucker" and can pose severe health problems for puppies that do not have a large blood supply to begin-with and can suffer badly from blood loss, anemia, diarrhea, weight loss, weakness, and sometimes death can result (Birchard and Sherding, 2005).

A seven month old male Labrador dog was presented in the Veterinary Clinical Complex of the Apollo College of Veterinary College with history of anorexia, hematemesis and melena with no foul smell since few days.No history of deworming was there. The animal was dull, depressed and showed tardy response to normal external stimuli. Physical examination revealed pale conjunctival mucous membrane, normal rectal temperature (101.2°F), tachycardia (125 beats/minutes), tachypnea (60 breaths/minutes) and peripheral lymph nodes were found slightly palpable.

Blood was collected aseptically from the cephalic vein by adopting a standard protocol. The hematological parameters like Hemoglobin (Hb), Packed Cell Volume (PCV), Total Erythrocyte Count (TEC), Total Leucocyte Count (TLC) were estimated by Auto-analyser (IDEXX Vet Autoread) and Differential Leucocyte Count (DLC) was carried out by Wright's staining technique. Serum sample were separated to evaluate Total Protein, Albumin, Globulin, Bilirubin, Creatinine, Alkaline Phosphatase, Aspartate Transaminase, Alanine Transaminase, Blood Urea Nitrogen by automatic analyzer (IDEXX Vet Test) as per standard diagnostic protocols.

Blood smear was made aseptically from ear tip and subjected for Giemsa staining to rule out any hemoprotozoan present in the animal. Fecal sample was also collected for microscopic examination (Flotation technique). The fecal examination revealed oval, thin-shelled eggs with 8-16 embryonated cells of *Ancylostoma caninum* (Fig. 1). No hemo-protozoan were detected in the blood smears. Hemato-biochemical findings are shown in Table 1.

Treatment was started with three tablets of Eazypet (Praziquantel 50 mg, Pyrantel pamoate 144 mg, Fenbendazole 500 mg), PO (It was given on the basis of weight of the dog @ 1tablet per 10 kg BW and combination therapy was given because of the drug resistance by the parasite studied in detail by many authors worldwide) OD and Inj. Dexamethasone 1 mg/kg, IM, OD for 3 days along with Dextrose Normal Saline & Ringer's Lactate 10 ml/kg, IV, BID. Supportive therapy includes Inj. Metronidazole 25 mg/kg, IV, BID, Inj. Ranitidine @ 0.5 mg/kg, IV, OD, Inj. Metoclopramide @ 0.2 mg/kg IV BID for 5 days, Inj. Clotase (haemocoagulase enzyme) 1ml IV BID for 2 days and Syp. aRBC (multi minerals and vitamins) 2 tsf PO BID for 15 days. Improvement was noticed just after five days of treatment and completely recovered after 20 days of treatment.

Anthelmintic drugs approved for the treatment of *A*. *caninum* include febantel, moxidectin, milbemycin oxime,

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Fig. 1. Embryonated cells of Ancylostoma caninum.

fenbendazole and pyrantel (FDA, 2012). In registration studies, febantel, moxidectin and milbemycin oxime all demonstrated efficacy of > 99% (FDA, 2012), fenbendazole demonstrated efficacy of > 98% (FDA, 1983) and pyrantel demonstrated a somewhat variable efficacy, with a mean across studies of approximately 94%, where more than half of those studies yielded > 99% (FDA, 1993). Monitoring the efficacy of anthelmintic treatments is an important aspect of small animal practice. In this study, Praziquantel, Pyrantel pamoate and Fenbendazole with the recommended dose of one tablet per 10 kg body weight was shown to be highly effective for Ancylostoma *caninum* based on the absence of egg recovery in the fecal sample. Effective treatment is also an important public health measure because A. caninum is a zoonotic parasite. Our study aimed to evaluate a combination anthelmintic

Hemeto-biochemical findings in a hookworm infected dog

Parameters	Reference Range	Pre-Treatment	20 th day
Hb (g/dl)	11.9-18.9	7.6	10.8
PCV(%)	35-57	30	36
TEC $(10^6/\text{cmm})$	4.95-7.87	3.77	4.83
TLC $(10^3/\text{cmm})$	5.0-14.1	6.94	7.66
Neutrophils (%)	58-85	80	68
Lymphocytes (%)	8-21	15	18
Monocytes (%)	2-10	1	8
Eosinophils (%)	0-9	4	6
Basophils (%)	0-1	0	0
ALT (U/L)	10-109	78	35
AST(U/L)	13-15	39	26
BUN (mg/dl)	8-28	24	17
Creatinine (mg/dl)	0.5-1.7	0.8	0.6
Total protein (mg/d	1) 5.4-7.5	4.5	7.1
Albumin (mg/dl)	2.3-3.1	2.1	3.3
Globulin (mg/dl)	2.7-4.4	2.5	3.8
Bilirubin (mg/dl)	0.0.3	0.25	0.1
ALKP(U/L)	1-114	83	81

therapy along with supportive treatment for dogs with hookworm infection. We hypothesized that a combination of anthelmintics would eliminate *A. caninum* ova shedding as also reported by Castro *et al.*, 2019.

Our study concluded that A. caninum infection in dogs revealed decrease in Hb, PCV, TEC and TP and an increase in ALT and AST levels. The key reason for anemia might be due to infected larvae secrete a molecule (Ac-asp-2) related to venom allergens in response to host-specific signals which is most powerful natural anticoagulant that exist (Hawdon et al., 1999). It causes severe anemia and hence death of the pets, if antihelminthics of choice are not given on time. Hypoproteinaemia is characteristic in ancylostomosis due to serum seepage around the site of attachment in the intestine which could reduce blood protein by more than 10 per cent (De et al., 2016). In conclusion it is proposed that regular treatment with Praziguantel, Pyrantel pamoate and Fenbendazole will help in reduction of fecal shedding of eggs and the combination of Anthelmintics should be used for effective treatment of Hookworm infection in dogs.

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