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Clinical Article

BLOOD TRANSFUSION IN TWO DOGS WITH SUSTAINED ANAEMIA AND HYPOPROTENEMIA DUE TO ANCYLOSTOMIASIS: A CASE REPORT

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SUMMARY

Two female dogs one-two years and other three years of age were presented to the Veterinary Clinical Complex, College of Veterinary Science, Lakhimpur, with a history of anorexia, melena and chronic vomiting. Clinical examination revealed pale mucous membranes, mild ascites, tachycardia, respiratory distress, sub-normal temperature and blood in the faeces. Haemato-biochemical and faecal examination revealed severe anaemia and hypoproteinemia and eggs of *Ancylostoma caninum*, respectively. Based on history, clinical and laboratory findings the case was diagnosed as chronic parasitic haemorrhagic gastroenteritis. To prevent haemorrhagic shock due to the blood loss transfusion of whole blood from the compatible healthy animal was transfused to both the dogs followed by primary treatment with anthelmintic and supportive medication along with proteinrich diet. Subsequently both the animal recovered uneventfully after 28 days of treatment.

Keywords: Anaemia, Ancylostomiasis, Blood transfusion, Hypoprotenemia, Melena

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Anaemia is defined as an absolute decrease in the haemoglobin (Hb) concentration, red blood cell numbers, or packed cell volume. *Ancylostoma caninum* is a major cause of fatal haemorrhagic enteritis in dogs (Aziz *et al.*, 2020). Ancylostoma causes blood loss and a deficiency of iron and plasma protein (Rao *et al.*, 2021). Depletion of plasma protein is one of the causes of anaemia and ascites in dogs (Chaturvedi *et al.*, 2013). A dog with limited protein is unable to produce the usual amount of globin and thereof haemoglobin (Hahn and Whipple, 1939).

Two privately owned crossbred female dogs, two years and other three year old weighing 13 kg & 11 kg, respectively, with history of anorexia, vomiting, tarry coloured stools and no deworming and vaccination,were referred to the veterinary clinical complex, Lakhimpur College Veterinary Science, Assam Agricultural University. Anamnesis revealed anorexia, blood in faeces and vomiting. For subsequent description of all results both the animals were assigned identification numbers as AN1 (animal weighing 13 kg) and AN2 (animal weighing 11 kg) respectively. On clinical examination blanching of mucous membrane, mild ascites, tachycardia, respiratory distress, sub-normal temperature (AN1:99ºF and AN2:98.5ºF) and melena were observed. To determine the cause of anaemia, two milliliters of blood sample were collected from the cephalic vein in an EDTA vacutainer and sent for haemoprotozoa examination and complete blood count (CBC). Two milliliters of blood samples were also collected in a clot activator for collection of serum and biochemical estimation. Faecal samples were also collected for worm examination. Blood from both the animals was negative for haemoprotozoa. CBC and biochemical estimation results of AN1 and AN2 are mentioned in Table 1. Faecal examination, of both the animals revealed oval, thin-shelled eggs of *Ancylostoma caninum* (Fig. 1). Based on the history, clinical findings, haemato-biochemical and faecal examination both cases were diagnosed as ancylostomiasis with concurrent severe anaemia and hypoproteinemia.

As an immediate therapeutic measure, both the animals were subjected to whole blood transfusion. Two clinically healthy animals, non-pregnant, crossbred dogs properly dewormed and vaccinated from the same owner were brought to the clinics as donor and their initial CBC and biochemical estimation were performed to check the health status of the animal. Hb values of the two donors were recorded to be 13.3 gm/dl and 12.98 gm/dl whereas the PCV value was 38% and 44%. To avoid the incompatibility during blood transfusion major and minor cross-matching was done (Figs. 2, 3, 4). Emergency blood transfusion was performed by collecting 10 ml of blood every one kg of recipient animal (Figs. 5-6) in CPDA-1 (1ml for every 10 ml of blood collected from the donor) containing blood transfusion bag (Vetblood®, Research lab and Pharmacy, Maharashtra, India) from the jugular vein. Within one hour of collection, blood was administered through the jugular vein using an 18G needle (Figs. 7-8). For the first 10 minutes, infusion was continued as one drop every five seconds, and continued afterward, as one drop per second. No side effect was observed during and after transfusion. Further, *Eazypet*® tablet @ one tablet per 10 kg b.wt. orally, *Lysbin*® tablet for medium size breed @ 1 tablet daily orally for 30 days, *Sharkoferrol* pet® syrup@ 5

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Table 1

Haemato- Biochemical parameters

Parameters	Reference Value (Yadav *et al.*, 2021)	Days of treatment			
		0		28	
		AN1	AN2	AN1	AN2
Haemoglobin (g/dl)	12-19	3.98	2.34	12.5	12.34
PCV (%)	35-57	17.30	18.23	37.54	39.33
TEC (106/µL)	4.9-7.87	4.24	3.12	5.38	5.22
MCV (fl)	66-77	32.34	33.47	67.76	68.12
MCHC (%)	32-36.3 Chaturvedi *et al.*, 2013	18.26	20.58	34.42	32.11
Total Protein (g/dl)	5.4-7.5	4.3	4.1	5.5	5.7
ALT (U/L)	15-43	22.6	28.12	23.26	27.12
AST (U/L)	19-70	32.45	31.98	32.56	33.45
BUN (mg/dl)	8-28	13.76	12.35	12.65	13.54
Creatinine (mg/dl)	0.5-1.7	0.87	0.93	0.89	1.01

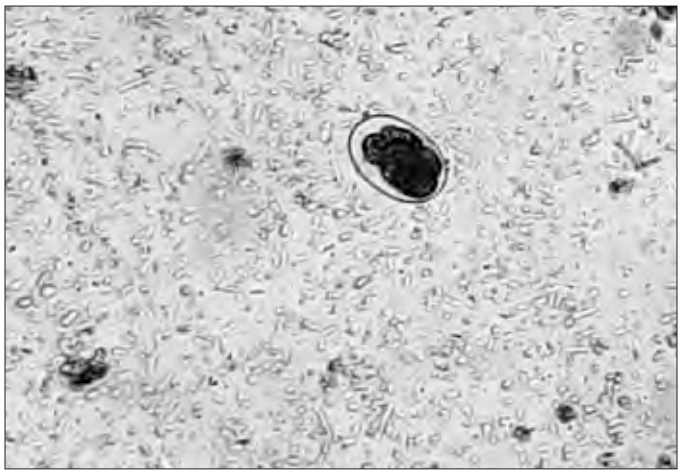

Fig. 1. *Ancylostoma caninum* egg

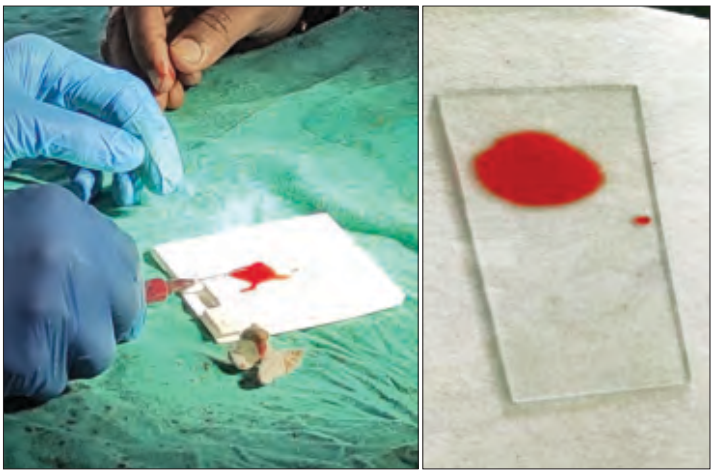

Fig. 2-3. Major and minor cross-matching of blood from recipient and donor with no agglutination

ml daily orally for 30 days were prescribed for used at home, Pan 40® injection @1 mg/kg b.wt. I/V for 5 days, Vomiset® injection @ 0.5 mg/kg b.wt. I/M. S.O.S, Botropase® injection @ 1 ampoule I.M. S.O.S., Metrogyl ®injection @ 10 mg/kg b.wt. I/V bid for 5 days were administered at clinics, and protein-rich diet (white part of the egg) were advised to the owner for both the dogs. After three days of the blood transfusion there was no vomiting, no blood in faeces reduced but appetite did not return to normal. However, after 15 days animal was taking feed normally, there was no vomiting or blood in faeces, mucous membrane was slightly pink. Both the dogs recovered on the 28th day of treatment, and all the haemato-biochemical and physiological parameters were within reference value. The faecal sample was negative for the parasitic ova.

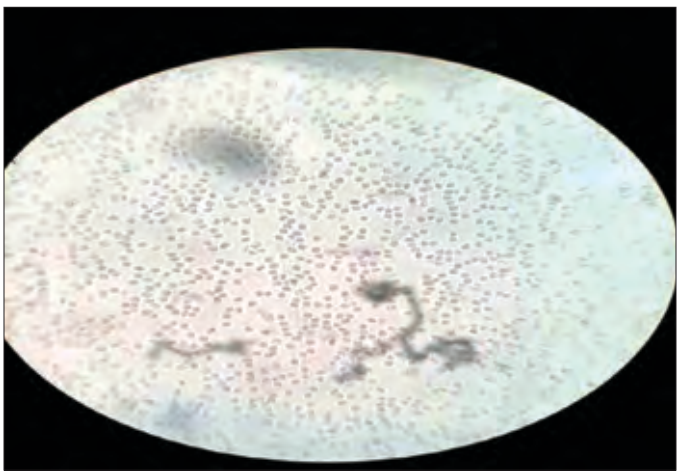

Fig. 4. Microscopic examination of blood cross-matching shows no clumping of RBC's

Blood transfusion is found to be the one of the effective life-saving treatment to prevent haemorrhagic shock (Suthar *et al.*, 2020). Similarly, in the present case, the blood transfusion was done to prevent hemorrhagic shock and no side effects were recorded during the study. The animal responded well to the blood transfusion. *Ancylostoma* sp. is found to be associated with anemia and protein loss in

dog (Rao *et al.*, 2021; Aziz *et al.*, 2021). The key reason for anemia and hypoprotenemia in ancylostomiasis is due to the blood sucking activity of the parasite in the intestine and around the site of attachment, causes serum seepage of protein, leading to hypoproteinemia (Aziz *et al.*, 2021). Hypoproteinemia leads to a decrease of globin and thereof less haemoglobin production. In the present case, anaemia and hypoproteinemia due to ancylostomiasis was cured after blood transfusion treatment with a proper anthelemintic, protein-rich diet and supportive drugs.

Blood transfusion after proper compatible test can be performed in severe anaemic animal to prevent the collapse of the patient from the haemorrhagic shock. Primary treatment for the etiology of haemaorrhage along with supportive treatment is important for complete recovery of the patient.

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