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SHORT COMMUNICATION

Hospital Prevalence of Canine Hemolytic Anemia in Punjab

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ABSTRACT

The present study was conducted on anemic dogs presented to the small animal clinics of the department of Veterinary Medicine GADVASU Ludhiana, Punjab from September 2014 to August 2015. Total number of the cases screened randomly in this period were 1749 and among them 214 cases were having haemolytic anemia and the prevalence was 12.25%. The most prevalent causes of haemolytic agent was *Ehrlichia canis* in this study followed by *Babesia gibsoni*, primary immune-mediated haemolytic anemia, neoplasia, *Babesia canis* and toxicity.

Keywords: anemia, babesia, *Ehrlichia canis*, prevalence

Anemia is defined as the decrease in the amount of red blood cells (RBCs) or hemoglobin in the blood. It is a clinical and laboratory sign and not a disease which results from different primary conditions and diseases (Giger, 2005). It can either occur from excessive destruction of RBCs, RBC loss due to haemorrhage or decreased RBC production (Susan and Asa, 1998). Hemolytic anemia is typically regenerative type with reticulocyte count greater than 1-1.5% (Cowgill *et al.* 2003). It results from lysis of RBCs in either intra or extravascular space. Regenerative anemia results when red cells are lost through hemorrhage or hemolysis. The marrow can expand its output up to 10 times the normal rate, so that low grade blood loss may be associated with reticulocytosis without anemia. It is only when the loss exceeds the rate of production which results in anemia.

By using systematic approach of signalment, history, physical examination and laboratory testing, we can establish the etiology of most of cases of haemolytic anemia. In dogs, the most common cause of hemolytic anemia is immune mediated (60%–75%), although infections, toxicities (onion, ginger, zinc, copper toxicity), RBC trauma, hypophosphatemia, vaccines, heritable RBC membrane defects can also cause hemolysis (pyruvate kinase deficiencies are seen in basenjis, beagles, west highland white terriers, cairn terriers, and other breeds) (Giger, 2005; Piek *et al.* 2008; Kahn, 2010). The hemoprotozoans are mainly responsible for high prevalence of secondary IMHA besides other causes like onion, ginger, zinc, copper, drug or onion toxicity or neoplacia.

The present study was conducted on dogs presented to Veterinary Medicine GADVASU Ludhiana from September 2014 to August 2015. Evaluation of patient with anemia of unknown cause started with a thorough history including vaccination status, deworming status, diet, and travel, duration of signs, drug or toxin exposure, prior or current illness. Then physical examination was conducted which included rectal temperature, colour of visible mucus membranes, petechiae and stool color, determination of heart rate and rhythm, evaluation of size of lymph nodes, liver and spleen and palpation of abdomen for masses (which were confirmed by radiography and ultrasonography). Symptoms of hemolytic anemia are similar to other anemia symptoms specifically related to hemolysis include jaundice and dark colored urine due to the presence of hemoglobin (hemoglobinuria).

After proper restraining of the animal, 5 ml of blood was aseptically collected in EDTA coated vials from the cephalic or saphenous vein for haematology, biochemistry and polymerase chain reaction (PCR). The Hb was determined by an automated blood counter (Beckman Coulter, Coulter diff Ac. T, USA). The dogs having Hb below 12 g/dl were declared anemic (Singh *et al.* 2012). Blood smear examination was done for the diagnosis of haemoprotozoans. Suspected cases negative for haemoprotozoans on blood smear examination were confirmed by PCR for *E. canis* and Babesia. Plasma concentration of phosphorus was determined with an automated clinical chemistry analyzer (Johnson and Johnson VITRϕS 750Xrc and fully automated chemistry system) by using standard kits (Johnson and Johnson diagnostic kits, Mumbai, India). For immune mediated hemolytic anemia diagnosis was done by using Coombs' test and in-saline agglutination. Radiography and ultrasonography was done as and when required.

Table 1: Distribution of anemia on the basis of etiology

Etiology	N	Percentage	Mean±SE	Range
Ehrlichia canis	97	5.55	8.30±0.20	2-11.9
Babesia gibsoni	61	3.49	8.11±0.47	1-11.8
IMHA	26	1.49	4.26±0.46	2-8.1
Neoplasia	16	0.91	8.47±0.60	4.8-11.9
Babesia canis	9	0.51	8.00±1.15	1.4-11.8
Onion/Ginger Toxicity	5	0.29	7.33±0.96	4.5-11.3
Others	568	32.48	8.61±0.11	1.9-11.9

N= No. of cases

SE= Standard Error

Statistical analysis was done by using SPSS-16 software for calculation of mean, standard error and range.

Among 1749 randomly selected cases, haemolytic anemia was seen in 214 cases with a prevalence of 12.25%. The most frequently seen haemolytic agent was *Ehrlichiacanis* in this study followed by *Babesiagibsoni*, primary immune-mediated haemolytic anemia, neoplasia, *Babesiacanis* and toxicity.Prevalence of *Ehrlichiacanis* was 5.55% (fifty four *Ehrlichiacanis*were confirmed by blood smear examination and fourty three were confirmed by PCR), *Babesiagibsoni* 3.49%, primary immune-mediated haemolytic anemia (PIMHA) (1.49%), neoplasia 0.91%, *Babesiacanis* 0.51% and toxicity (onion/ginger) 0.29% as shown in Table 1. Various workers have reported the overall incidence of canine babesiosis from the Northern part of India in range of 0.66 to 8.9 per cent (Varshney and Dey 1998 and Chaudhuri, 2006) while from Southern India an overall 11.6 % prevalence of canine haemoprotozoan has been recorded (Kumar *et al.* 2009). Lakshmanan *et al.* (2006) has observed 5.66 % prevalence for canine ehrlichiosis which is similar to our study. Wide variation in climatic conditions prevailing in different parts of India might be responsible for varying percentage of these tick borne infections. Liu and Su (2015) have reported that severe anemia primarily results from infectious disease-related anemia, followed by immune-mediated hemolytic anemia and other disease-related anemia and among the 43 infectious disease-related very severe anemic dogs, the most commonly diagnosed pathogen was *Babesiagibsoni* followed by *Ehrlichiacanis* than *Babesiacanis.* Total number of non-hemolytic anemic cases were 568 and their prevalence among anemic cases was 32.48% and their causes included, renal failure, haemorrhagic gastroenteritis, hook worm infection, lice and tick infestation, coccidia, diabetes mellitus, anorexia, wounds and bone marrow suppression.

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