PREVALENCE OF SECONDARY IMMUNE MEDIATED HAEMOLYTIC ANAEMIA IN DOGS IN AND AROUND TIRUPATI

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ABSTRACT

The present study was conducted on anaemic dogs presented to the small animal clinic from January 2018 to May 2019. Out of 1299 anaemic dogs examined 243 dogs were found positive for secondary haemolytic anaemia. The prevalence was 18.70 per cent. The most common causes of secondary haemolytic anaemia were *Babesia gibsoni* followed by *Ehrlichia canis*, *Babesia canis*, leptospira spp., neoplasia and *Hepatozoon canis*. Most common symptoms observed in secondary IMHA were pale mucous membranes, enlarged lymphnodes, yellow colour urine. The most common age group is between 4-10 years.

Key words: Anaemia, secondary IMHA, haemoprotozoans*, E. canis*, *B. gibsoni*

Introduction

Anaemia is a condition, characterised by reduction in circulating erythrocytes or haemoglobin or both. Giger (2005) denotes it is a clinical manifestation due to varying aetiology and does not denote a disease entity by itself. Naigamwalla *et al.* (2012) stated that the clinical findings or manifestation of anaemia are pallor of mucous membranes, lethargy, debility, loss of appetite, increased cardiac and respiratory rates. However, the multitude of potential causes can make determining the underlying diagnosis a challenging and frustrating endeavour. With a basic understanding of red blood cell production and a systematic diagnostic approach, clinicians should be able to clearly define the cause of anaemia in most cases.

A systematic approach of signalment, history, physical examination and laboratory examination may reveal the aetiology of most of the cases of haemolytic anaemia. Immune-mediated hemolytic anaemia (IMHA) is a common autoimmune disorder in dogs and a model of acute and clinically relevant anaemia. It affects both sexes but occurs more often in female, middle-aged animals. IMHA can be idiopathic (primary) or secondary to infectious (Babesia, Ehrlichia, Hepatozoon, Anaplasma and Borrelia), neoplastic and autoimmune disorders. There is an acute regenerative anaemia with accompanying hypoxia. Destruction of erythrocytes can be intravascular (as a result of complement system activation) or extravascular (removal of antibody-coated red blood cells by the macrophages in the liver and spleen). Tick-borne hemoparasites are one of the most import ant vector-borne infections of dogs. Among them, tick-borne hemopathogens such as Babesia, Ehrlichia, Anaplasma, Borrelia, and Hepatozoon are of major health concern to dogs. The characteristic finding in haemolytic anaemia is reticulocytosis and polychromasia. Liu and Su (2015) stated that *B. gibsoni* infection represents a very important pathogen associated with anaemia, especially severe and very severe anaemia.

Materials and Methods

The present study was conducted in dogs presented to small animal clinical ward, College of Veterinary Science, Tirupati from January 2018 to May 2019. All the anaemic dogs were thoroughly examined for appropriate collection of history including regular vaccination, deworming, diet, housing management, previous history of illness. Then physical examination of dogs included rectal temperature, pulse, colour of visible mucous membrane, patechiae, determination of heart rate and rhythm, palpation of size of lymphnodes, liver and spleen palpation for any enlargement (radiography and ultrsonography). Anaemia, dullness, anorexia, dark yellow colour urine, icterus mucous membrane are the most common symptoms observed in dogs affected with secondary haemolytic anaemia.

For laboratory analysis, 5 ml of blood was collected from affected dogs in an aseptic manner from cephalic vein or saphenous vein. Haematology, biochemical analysis and polymerase chain reaction (PCR) was done to establish causative etiology of secondary haemolytic anaemia. Haemoglobin was determined by using automated blood counter (BC 2008, Mindray). The dogs having Hb below 12 g/dl were declared anaemic (Singh *et al*., 2012). Peripheral blood smear examination was done for the detection of haemoprotozoans. Suspected cases negative for haemoprotozoans and all positive samples on blood smear examination were further confirmed by PCR for *B. gibsoni*, *E. canis* and *B. canis*. Leptospirosis cases were confirmed by Macroscopic agglutination test.

Radiography and ultrasonography was done as and when required. Primary IMHA cases were excluded on the basis of negative result for haemoprotozoans, in-saline agglutination test and coomb's test.

Results and Discussion

The most common clinical signs observed in dogs with secondary IMHA were pale mucous membranes, lethargy, inappetance, anorexia, yellow to red colour urine, enlarged lymph nodes as shown in Table 2. Frequency of symptomatology observed in IMHA dogs were pale mucous membranes (83.52%), lethargic (65.88%) tachycardia (55.29%), enlarged lymph nodes (48.23%), inappetance (45.88%), anorexia (44.70%), yellow colour urine (38.82%), dark yellow colour urine (31.76%), reddish urine (29.41%), vomition (27.05%), tachypnea (24.70%), external parasite infestation (23.52%), fever (22.35%), icteric mucous membranes (20.00%), melena (18.82%) and recumbency

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Table 1: Distribution of anaemia on the basis of etiology.

Etiology	N	Percentage
Babesia gibsoni	97	7.46
Ehrlichia canis	96	739
Babesia canis	17	1.30
Leptospirosis	12	0.92
Neoplasia	10	0.76
Toxicity	8	0.61
Hepatozoon canis	3	0.23
Total	243	

N= No. of cases

(11.76%).

In the present study IMHA cases were recorded in Labarador (22), German shepherd (19), Pomeranian (16), Pug (7), Rotweiller (6), Belgium Malinois (6) Mongrel (3), St Bernard (3) and Cocker Spaniel (1). Breed wise distribution shown in Table 3. The age of IMHA affected dogs ranged from 4 months to 10 years with a mean age of 4.13 ±1.45 years.

The hemoprotozoans are mainly responsible for high prevalence of secondary IMHA besides other causes like onion, ginger, zinc, copper, drug or onion toxicity orneoplacia. Out of 1299 anaemic cases 242 cases were found positive for secondary haemolytic anaemia. These findings were in accordance with Bhat *et al*. (2016) and Lachungpa *et al.* (2019). In our study *Babesia gibsoni* was important pathogen of severe anaemia in dogs. Lui and su (2015) have reported that severe anaemia primarily results from infectious related anaemia followed by immune mediated haemolytic anaemia and among the most commonly diagnosed pathogens were *Babesia gibsoni* followed by *Ehrlichia canis* than *Babesia canis*.

Frequency of symptomatology observed in secondary IMHA dogs were pale mucous membranes (83.52%), lethargy (65.88%), tachycardia (55.29%), enlarged lymph nodes (48.23%), inappetance (45.88%), anorexia (44.70%), yellow colour urine (41.17%), dark yellow urine (34.11%), reddish urine (31.76%), vomition (27.05%), enlarged lymph nodes (24.70%), tachypnea (24.70%), external parasite infestation (23.52%), fever (22.35%), icteric mucous membranes (20.00%), melena (18.82%) and recumbency (11.76%). These findings were in accordance with Lachungpa *et al*. (2019).

In the present study secondary IMHA cases were recorded in Labarador (57), German shepherd (54), Pomeranian (41), Rotweiller (21), Pug (17), Belgium Malinois (16), Mongrel (13), St Bernard (13) and Cocker Spaniel (11). High incidence in Labrador, German Shepherd and Pomeranian may be due to the over presentation of these breeds in the clinics. The age of IMHA affected dogs ranged from 4 months to 10 years with a mean age of 4.13 ± 1.45 years.Higher incidence of secondary IMHA was reported by Lachungapa *et al.* (2019). Similar findings were reported by Riyaz *et al*. (2016) and Lachungapa *et al.* (2019). Higher incidence in Cocker Spaniel also reported by Burgess *et al.* (2000), which is contrary to the finding of present study. This might be due to the under representation of the breeds in the dog population of this area. Nassiri *et al*. (2005) reported the mean age of the dogs with IMHA was 3.7 years which is similar to our study and other studies has reported the mean age of dogs with IMHA was 1-13 years (Burgess *et al.,* 2000).

In conclusion secondary IMHA was more common due to *Babesia gibsoni* infection. Most common symptoms observed in secondary IMHA were pale mucous membranes, enlarged lymphnodes, yellow colour urine and most common in the age group 4-10 years.

Table 2: Frequency of symptomatology of IMHA in dogs

Clinical findings	N	Percentage
Pale mucous membranes	71	83.52
Lethargic	56	65.88
Tachycardia	47	55.29
Enlarged lymph nodes	41	48.23
Inappetance	39	45.88
Anorexia	38	44.70
Yellow urine	33	38.82
Dark yellow urine	27	31.76
Reddish urine	25	29.41
Vomition	23	27.05
Tachypnea	21	24.70
External parasite infestation	20	23.52
Fever	19	22.35
Icteric mucous membranes	17	20.00
Malena	16	18.82
Recumbency	10	11.76

Table 3: Breed wise distribution of IMHA in dogs

S.No.	Breed	No. of IMHA cases
1.	Labrador	57
2	German shepherd	54
3	Pomeranian	41
4	Rotweiller	21
5	Pug	17
6	Belgium malinois	16
7	St. bernard	13
8	Mongrel	13
9	Cocker Spaniel	11

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