SHORT COMMUNICATION

First Report of Immune Mediated Haemolytic Anaemia Associated with Haemoparasitic Infections of Canine in Aizawl, Mizoram

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Abstract

A systematic study about immune mediated haemolytic anaemia (IMHA) from northeast part of India especially Mizoram is lacking. Since IMHA can be triggered by parasites and there are reports about *Ehrlichia canis* and *Babesia gibsoni* in dogs from Mizoram, the present study was carried out to investigate the occurrence of IMHA associated with haemoparasitic infections in dogs in and around Aizawl (India). The dogs (n=100) were selected based on the symptoms like icterus, pale mucus membrane, lethargy, anorexia, fever, and other symptoms associated with haemolytic anaemia. The IMHA was confirmed in 35 dogs out of 100. Occurrence of IMHA associated with haemoparasitic infections was 34.29 % (12/35). *Babesia gibsoni* (75%) was the common causative agent for occurrence of IMHA associated with haemoparasitic infections in dogs in and around Aizawl. It was found to be more prevalent in 2-8 years age group (50%) and in females (58.33%). The breed-wise higher occurrence was found in non-descript dogs (58.33%).

Key words: Antibody detection test kit, *Babesia gibsoni,* Coomb's test, Dogs, Immune mediated hemolytic anaemia (IMHA)

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Introduction

Immune-mediated haemolytic anaemia (IMHA) is a haematological disorder affecting dogs and is due to antibody mediated destruction of RBCs directly within the circulation. The first case series of 19 dogs with IMHA was described in the 1960s (Piek, 2011). But the condition was reported in Veterinary Medicine around 1970s (Horgan *et al.,* 2009). It can be primary or idiopathic and secondary (which is due to infectious or neoplastic disorders). Immune-mediated RBC destruction may be reduced or stop, and adverse consequences of long-term immunosuppressive treatment can be avoided if diseases causing IMHA are eliminated. Common clinical signs are related with severe anaemia and the resultant inflammatory response (Balch and Mackin 2007; Garden *et al*., 2019). Fleischman (2012) described that in dogs, the presence of spherocytes and autoagglutination suggests IMHA. The diagnosis of IMHA is supported by a low haematocrit with one or more of the following: auto-agglutination, positive Coomb's test result, spherocytosis, and osmotic fragility. Persistent agglutination reveals the presence on the surface of RBCs of anti-RBC immunoglobulin and facilitates IMHA diagnosis, but it does not indicate whether the IMHA is primary or secondary. Park *et al*. (2016) discussed that tick-borne diseases such as ehrlichiosis or babesiosis were suggested to be possible causes of Coombs-positive IMHA. A systematic study about IMHA from northeast part of India is lacking. Hence, there is shortage of scientific data. In view of these facts, the study was planned to find the occurrence of immune mediated haemolytic anaemia associated with haemoparasitic infections in dogs in and around Aizawl.

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Materials and Methods

The study was conducted with the approval of Institutional Animal Ethics Committee (IAEC), College of Veterinary Sciences & Animal Husbandry, CAU, Selesih, Aizawl (Mizoram, India) *vide* reference number CVSC/CAU/IAEC/20-21/P-14 dated 24th September 2021.

A total of 100 dogs of either sex brought for treatment to the Veterinary Clinical Complex of the College at Selesih, and Veterinary dispensaries of Mizoram state were screened to find out the occurrence of Immune mediated haemolytic anaemia associated with haemoparasitic infections. These dogs were selected based on the symptoms like icterus, pale mucus membrane, lethargy, anorexia, fever, and other symptoms associated with haemolytic anaemia. The confirmation was done based on blood smear examination, and various other lab tests. For age-wise occurrence of IMHA associated with haemoparasitic infections, the dogs were classified into three groups, *viz.,* 1-2 years, 2-8 years and above 8 years. The observations were also groups as per sex and breed of dog.

Results and Discussion

The occurrence of IMHA associated with haemoparasitic infections in dogs in and around Aizawl was 34.29% (12/35; Table 1). This was more than the reported cases with Piek (2011) in Netherlands, where he described the incidence of secondary IMHA in dogs as 20-25%. These changes might be due to unreported as well as undiagnosed cases in the area, presence, or absence of intermediate hosts in the area and related to the management and health practices.

Table 1: Occurrence of Immune mediated haemolytic anaemia associated with haemoparasitic infections in dogs in and around Aizawl

Haemoparasites	No. of dogs with haemoparasitic infection (35/100)	No. of dogs with IMHA associated with haemoparasitic infection (n=12)	%
Babesia gibsoni	16	12	75.00
Babesia canis	8	-	-
Ehrlichia canis	11	-	-
Total	**35**	**12**	**34.29**

It was found that *Babesia gibsoni* (75%) (Table 1) was the common causative agent for occurrence of IMHA associated with haemoparasitic infections in dogs. Ashwini and Pillai (2017) found that majority of diagnosis with IMHA, were secondary IMHA (76%) caused by haemoparasites such as *Babesia gibsoni, Babesia canis, Ehrlichia canis, Mycoplasma haemocanis* and sheathed microfilaria. Lachungpa *et al*. (2019) reported 59.37% secondary IMHA cases and found that *Babesia gibsoni* was the major underlying cause, which agrees with the present finding. Similarly, Teodorowski *et al*. (2022) reported that *Babesia gibsoni* infections are more severe than *B. canis* infections and identification of species is important in selecting the appropriate drugs as well as for understanding the course of the disease.

Age wise occurrence was found to be higher in 2-8 years age group (50%) followed by 1-2 years (25%) and above 8 years (25%, Table 2). The higher occurrence of IMHA associated with haemoparasitic infections found between 2-8 years of age (50%) agreed with Lachungpa *et al.* (2019). Balch and Mackin (2007) also described the mean onset of age as approximately 6 years though it can occur at 1-13 years of age. Reddy *et al.* (2016) opined that *Babesia* infection leads to considerable damage to the host, and this depends on the virulence and pathogenicity of the agent, but the extent of the injuries depends on the age and the hygiene of the dogs.

Sex-wise occurrence of IMHA associated with haemoparasitic infections in dogs was found to be more in females (58.33%) when compared with the male dogs (41.66%, Table 2), which agreed with observations of Piek (2011). Protective nature of androgen present in male dogs could be the reason for less susceptible to IMHA as stated by Weinkle *et al*. (2005). But in a study by Teodorowski *et al.* (2022) noted that there was no significant difference between age, sex, or place of residence of dogs.

In the present study, the breed-wise occurrence was found to be higher in non-descript (58.33%) followed by Spitz (25.00%) and German Shepherd (16.66%, Table 2). This might be due to preferences of dog owners for the non-descript dogs in this locality. Lachungpa *et al.* (2019) reported occurrence of IMHA in Spitz and German Shepherd breeds of dogs. Hartelt *et al*. (2007) reported more incidences of *B. gibsoni* in American Pitbull terriers and related breeds and this can be due to transmission of the agent through saliva, wounds, or ingestion of blood because of bite injuries.

Table 2: Age, sex and breed-wise occurrence of IMHA associated with haemoparasitic infections in dogs (n=12)

Age (years)	No. of dogs	%
1-2	3	25.00
2-8	6	50.00
Above 8	3	25.00
Sex	**No. of dogs**	**%**
Male	5	41.66
Female	7	58.33
Breed	**No. of dogs**	**%**
Non-descript	7	58.33
Spitz	3	25.00
German Shepherd	2	16.66

The present study concluded that the occurrence of immune mediated haemolytic anaemia (IMHA) associated with haemoparasitic infections in dogs in and around Aizawl was 34.29% and *Babesia gibsoni* (75%) was the common causative agent. Age-wise occurrence of IMHA associated with haemoparasitic infections was found to be more in 2-8 years age group (50%) and sex-wise it was higher in females (58.33%). The breed of dogs most prone was non-descript (58.33%).

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