

Prevalence of diseases caused by canine blood parasites in Companion Veterinary Clinic, Melaka, Malaysia

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ABSTRACT: A disease caused by canine blood parasites (tick-borne diseases) is a condition in which dogs are bitten by tick-carrying pathogens. This study assessed the prevalence of diseases caused by canine blood parasites (*Anaplasmosis*, *Babesiosis*, and *Ehrlichiosis*) at the Companion Veterinary Clinic, Melaka, Malaysia, from August 2020 to July 2022. Secondary data of 103 infected dogs were obtained from medical records. Dogs at the puppy stage were more commonly diagnosed (26.21%). Both males and females showed almost the same prevalence of 52.43% and 47.57%, respectively. Mongrel had a relatively higher prevalence compared to pedigree dogs but there was no breed predisposition. Multiple infections were more common than single infections. Canine tick-borne diseases show a higher prevalence during the intermonsoon season in Malaysia. Anorexia, inactivity, and bleeding diatheses are the most common clinical signs observed in dogs. To support the diagnosis, anaemia and thrombocytopenia were observed in the patient's complete blood count results. The test kit was positive when antibodies or antigens were detected and parasites could also be observed under a microscope using a blood smear. The prevalence of tick-borne diseases is influenced by intrinsic (age and sex) and extrinsic factors (weather).

Keywords:

blood parasites, canine, prevalence, tick-borne diseases

■ INTRODUCTION

When a dog is bitten by a tick carrying a pathogen, the pathogen is transmitted to the dog and causes tick-borne diseases (Sykes 2023). A number of these infections are zoonotic, which means they can spread to people as well. As these pathogens must complete their lifecycle phase in the tick to become infectious, the disease is not directly transmitted from dogs to humans (Wikel 2022). Therefore, although humans and other non-canine family members can also contract the illness, a tick bite is necessary for disease transmission. The most common tick-borne diseases are *Ehrlichiosis*, *Anaplasmosis*, *Babesiosis*, and *Lyme* disease (Baneth 2014). This paper focuses on the prevalence of *Anaplasmosis*, *Babesiosis*, and *Ehrlichiosis* in canines.

■ MATERIALS AND METHODS

The materials used in this study were secondary data collected from the database of the Companion Veterinary Clinic, Melaka, Malaysia, including signalment of the patients (age, breed, and sex), clinical signs of each disease in infected dogs, laboratory diagnosis (haematology, blood smear, and test kit results), and treatment from August 2020 to July 2022. The data were then analysed descriptively in Excel based on the breed, age, and sex of the dog. Supporting documents such as haematology, blood smears, and test kit results will be used to support the diagnosis of dogs.

■ RESULTS AND DISCUSSION

Table 1 shows that canine tick-borne diseases show an age- and sex-predisposition. It was more likely to occur in puppies younger than 2 years old, as their immune system is not yet fully mature (Pereira *et al.* 2019). In addition, the number of cases that occurred in male dogs was slightly higher than that in females. This was because females had a higher percentage of T-cells than males. However, there was no breed predisposition, which could be influenced by the popularity of dogs in the area. Based on the results shown in Figure 1, multiple infections are more common than single infections. This was due to the same tick species, *Rhipicephalus sanguineus*, transmits multiple diseases and is commonly found in the same geographical areas. Additionally, dogs with *Anaplasmosis* may be more vulnerable to other infections like *Ehrlichia* and *Babesia* due to immune suppression caused by the *Anaplasma* infection (Gal *et al.* 2007).

Tick-borne diseases showed a higher prevalence during the intermonsoon seasons in Malaysia, between April to June and October to November. *R. sanguineus* ticks are active year-round in tropical and subtropical regions, thriving at temperatures between 20-35°C and relative humidity of 35-

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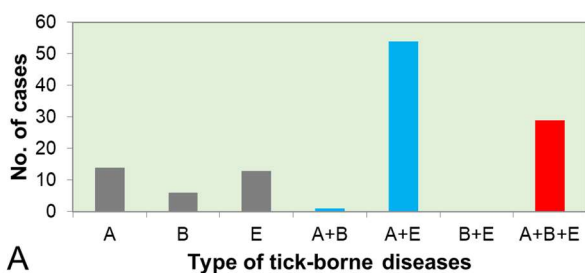
95% (Louly *et al.* 2006). They can reproduce up to three–four generations per year when favourable conditions are present. The equatorial location and humid tropical climate of Peninsular Malaysia, with average temperatures of 20–32°C and frequent thunderstorms during the intermonsoon seasons, provide ideal conditions for *R. sanguineus* ticks to reproduce and increase the incidence of tick-borne diseases.

The most common clinical signs include fever, anorexia, inactivity, haematuria, haematochezia, epistaxis, and haematemesis (Stich *et al.* 2008). Supporting diagnostics, such as CBC, test kits, and blood smears, can be used to diagnose tick-borne diseases. Anaemia and thrombocytopenia were common findings in the patient's blood test results. Based on the collected data, younger dogs were more susceptible to multiple tick-borne infections owing to immune suppression.

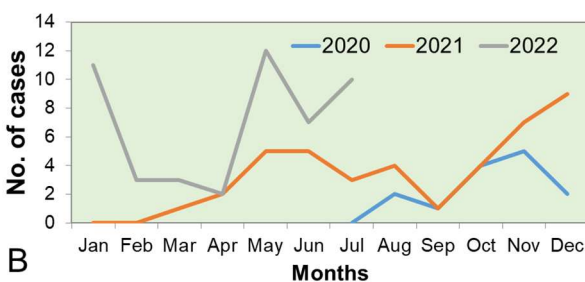
Both single and multiple infections result in clinical symptoms such as anorexia, fever, inactivity, and bleeding diatheses; however, multiple infections may cause more severe symptoms such as tremors, bloated abdomen, and seizures. As for the CBC results, the parameters in dogs with multiple infections showed more deviation from the normal range compared to single-infection dogs. This indicated that dogs with multiple infections showed more severe anaemia and thrombocytopenia than dogs with a single infection.

Table 1. Dogs with tick-borne diseases in different variables in canines at the Companion Veterinary Clinic, Melaka, Malaysia.

Variables	No. of cases	Percentage (%)	
Age (years)	0-2	27	26.21
	2-4	20	19.42
	4-6	16	15.53
	6-8	12	11.65
	8-10	9	8.74
	10-12	8	7.77
	12-14	9	8.74
	14+	2	1.94
Sex	Male	54	52.43
	Female	49	47.57
Breed	Mongrel	67	65.05
	Pedigree	36	34.95



A



B

Figure 1. Prevalence of tick-borne diseases in different (A) infection types and (B) months in canines at the Companion Veterinary Clinic, Melaka, Malaysia. A=Anaplasmosis, B=Babesiosis, H=Erhlichiosis.

The most common medication prescribed by veterinarians to treat tick-borne diseases is doxycycline (Carrade *et al.* 2009), with alternative antibiotics such as enrofloxacin, metronidazole, and oxytetracycline also recommended. Supportive therapy can take various forms, depending on the affected organs and accompanying symptoms. This includes high doses of corticosteroids, dietary and fluid support, methylcobalamin, transfer factor, and blood transfusions for severe cases (Wang *et al.* 2010). Early treatment leads to a good prognosis, and preventive methods, such as tick control and vaccination, could help reduce the risk of tick-borne diseases.

CONCLUSION

Canine tick-borne diseases were prevalent in dogs, with an average of 103 weekly cases from August 2020 to July 2022 at the Companion Veterinary Clinic. Intrinsic factors, such as the puppy and male dog immune systems, increase the risk of infection. There was no breed predisposition; however, its popularity may have influenced the prevalence. Extrinsic factors, such as perfect weather, increase the likelihood of disease. Common clinical signs include anorexia, inactivity, and bleeding diatheses. Proper laboratory diagnostics and test kits are crucial for an accurate diagnosis.

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