Canine babesiosis in Nueva Ecija, Philippines: A retrospective study from small animal veterinary clinics

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ABSTRACT: This study investigated the occurrence of canine babesiosis from 2020 to 2022 based on records from eight small animal veterinary clinics across four cities in Nueva Ecija: Cabanatuan, Gapan, Muñoz, and San Jose. Data on age, sex, breed, clinical signs, date of diagnosis, and owner address were collected and organized using Microsoft Excel. The results indicated that dogs aged 13 months and older had the highest incidence of babesiosis (52.86%). Male dogs (50.26%) were slightly more affected than females (47.66%). Toy breeds, particularly Shih Tzus, exhibited the highest infection rate (56.50%). Inappetence was the most commonly observed clinical sign (61.01%). The majority of cases (49.39%) occurred during the rainy season (June to November), with Cabanatuan reporting the highest number of cases (184 cases). Statistical analysis revealed significant associations between babesiosis and the dogs' age, sex, and breed.

Keywords:
babesiosis, profiling, statistical correlation, spatio-temporal, Philippines

■ INTRODUCTION

Canine babesiosis is an increasingly reported tick-borne disease caused by intraerythrocytic Babesia species, which invade red blood cells and induce immune-mediated hemolysis (Solano-Gallego et al. 2016; Obeta et al. 2020; Zygner et al. 2014). Diagnosis traditionally involves identifying large piroplasms in erythrocytes (Birkenheuer et al. 2004), although molecular tools have refined the classification into Babesia and Theileria genera (Irwin 2009). Multiple Babesia species infect dogs, including *B. canis, B. gibsoni*, and *B. conradae*, affecting all ages, with puppies being the most susceptible (Ayoob et al. 2010; Vishwakarma & Nandini 2020). Severe infections can affect multiple organs (Abalaka et al. 2018). To the best of our knowledge, there has been no published study on the spatial distribution of canine babesiosis in the Philippines. Disease occurrence in the country is influenced by environmental conditions, vector presence, and host-related factors, underscoring the importance of spatial mapping for effective control strategies.

■ MATERIALS AND METHODS

This retrospective study profiled confirmed canine babesiosis cases from 2020 to 2022 in four cities, Nueva Ecija, Gapan, San Jose, Cabanatuan, and Muñoz, using records from small-animal veterinary clinics. Data were obtained through formal email requests to ensure confidentiality. Only dogs diagnosed using 3-way (Babesiosis, Ehrlichiosis, and Lyme disease) or 4-way (Lyme disease, Ehrlichiosis, Anaplasmosis, and Heartworm) diagnostic kits were included.

Clinical and diagnostic data were compiled in Microsoft Excel. Descriptive statistics were applied to nominal variables (sex, breed, age group, clinical signs, and vaccination history). Associations with babesiosis were analyzed using chi-square tests via crosstabs, with significance set at $p < 0.05$.

■ RESULTS AND DISCUSSION

Table 1 shows a significant association between age and babesiosis incidence, with 52.86% of cases in dogs aged 13 months and older. This supports Obeta et al. (2020), who reported higher risk in dogs aged 12–36 months. Older dogs may be more susceptible due to prolonged exposure and declining immunity (Jegede et al. 2015). Male dogs showed higher prevalence, aligning with Chaurasia et al. (2022) and Adebayo et al. (2016), possibly due to behaviors like fighting. A case of Babesia canis infection in toy breeds, particularly Shih Tzus, was reported in Iran, where the dog had hemolytic anemia (Fathipour et al. 2021).

Common clinical signs included dark urine, fever, inappetence, jaundice, and lethargy. Most cases occurred during the rainy season (June–November), peaking in 2022 with 130 cases, likely due to increased Rhipicephalus sanguineus activity in humid conditions (Obeta et al. 2020). This aligns with Zygner et al. (2023), who observed similar seasonal trends in Zambia.

Table 1. Profiling of canine babesiosis from Small Animal Veterinary Clinics in Cities of Nueva Ecija, Philippines.

Parameters	Details	Freq., (%)
Age	0-6 months	26, (4.51)
	7-12 months	205, (35.53)
	>13 months	305, (52.86)
	Unknown	41, (7.11)
	p-value	0.001
Sex	Female	275, (47.66)
	Male	290, (50.26)
	Unknown	12, (2.08)
	p-value	0.004
Breeds	Toys	326, (56.50)
	Working dogs	46, (7.97)
	Mongrel	93, (16.12)
	Sporting dogs	10, (1.73)
	Non-sporting dogs	55, (9.53)
	Herding dogs	23, (3.99)
	Terriers	4, (0.69)
	Hounds	12, (2.08)
	Unknown	8, (1.39)
	p-value	0.003
Clinical Signs	Dark urine	157, (27.21)
	Fever	193, (33.45)
	Inappetence	352, (61.01)
	Jaundice	150, (26.00)
	Lethargy	344, (59.62)
Seasons	Rainy (Jun-Nov)	285, (49.39)
	Cool dry (Dec-Feb)	110, (19.06)
	Hot dry (Mar-May)	182, (31.54)
	p-value	0.278
Year	2020	89, (15.42)
	2021	199, (34.49)
	2022	283, (49.05)
	2023	6, (1.04)
	p-value	0.918

Figure 1 shows the spatial distribution of Babesia infections in Nueva Ecija, with case clusters in Barangays Bangad and San Isidro (Cabanatuan), San Lorenzo, San Nicolas, and Pambuan (Gapan), Poblacion East (Muñoz), and Abar 1st, Abar 2nd, Malasin, Caanawan, and Porais (San Jose). These findings indicate that Babesia cases were geographically clustered, suggesting potential environmental or vector-related factors contributing to localized transmission.
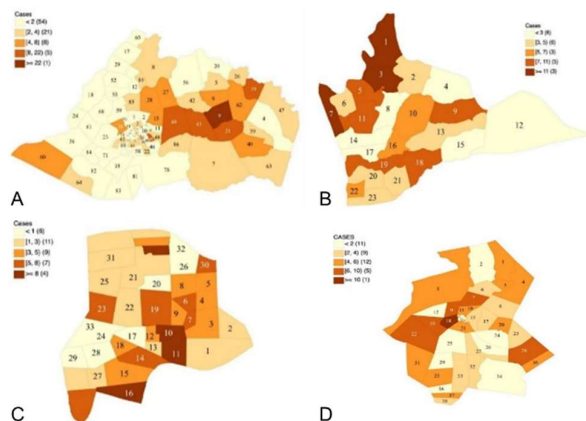

Figure 1. Spatial distribution of babesiosis from Small Animal Veterinary Clinics Cities of Nueva Ecija, Philippines. (A) Cabanatuan City, (B) Gapan City, (C) Science City of Muñoz, and (D) San Jose City.

■ CONCLUSION

Babesiosis was most prevalent in dogs aged ≥13 months, particularly among toy breeds. Inappetence was the most common clinical sign. The highest number of cases occurred during the rainy season, with Cabanatuan City showing the highest incidence. Identified risk factors included age, breed, environment, tick prevention, and season.

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