

Canine heartworm disease in Nueva Ecija, Philippines: A clinic based epidemiological study

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ABSTRACT: This study profiled canine heartworm disease (CHD) cases recorded from 2020 to 2022 in veterinary clinics across Cabanatuan, Gapan, Muñoz, and San Jose, Nueva Ecija. Data from eight clinics included age, sex, breed, preventive history, and clinical signs. A total of 378 confirmed CHD cases were identified using rapid antigen tests. Most infections occurred in dogs aged over 13 months (63.85%), with slightly higher prevalence in males (54.35%) and toy breeds (62.27%). Notably, 90.77% of affected dogs had no record of heartworm prophylaxis. Coughing (86.28%) was the most frequent clinical sign. Cases peaked during the rainy season (June–November), with Cabanatuan City recording the highest number (n = 304). Statistical analysis indicated a significant correlation between CHD and age. These findings highlight the importance of year-round preventive care and increased owner awareness, particularly in high-risk areas.

Keywords:

canine heartworm disease, epidemiology, seasonal variation spatio-temporal

■ INTRODUCTION

Canine heartworm disease (CHD), or dirofilariasis, is a potentially fatal condition caused by *Dirofilaria immitis* (Montoya-Alonso *et al.*, 2017). Adult worms, measuring 20–30 cm, inhabit the pulmonary arteries and may lead to congestive heart failure (Godel *et al.*, 2012). *D. immitis* poses a zoonotic threat as a cause of human pulmonary dirofilariasis, transmitted through mosquitoes of the genera *Culex*, *Aedes*, *Armigeres*, and *Anopheles* (Montoya-Alonso *et al.*, 2017). Vector distribution is influenced by environmental factors, mainly temperature and location, with 14 °C supporting vector activity in subtropical and temperate regions (McCall *et al.* 2008).

The persistence of CHD raises public health concerns owing to its irreversible cardiopulmonary consequences. Immunological approaches could be advanced by targeting parasite proteins that are essential for infection (Geary *et al.*, 2012). Both domestic and wild carnivores are susceptible, with dogs as primary reservoir hosts. Risk factors include competent mosquito vectors, outdoor housing, and free-roaming behavior (Bacsadi *et al.*, 2016; Kabusu *et al.*, 2020).

Despite growing awareness of CHD in tropical regions, data on local epidemiology remain limited, particularly in Nueva Ecija, where conditions favor mosquito proliferation. The lack of region-specific prevalence data has hampered the development of effective prevention strategies. This study aimed to determine the incidence and epidemiological profile of canine heartworm infection among dogs in veterinary clinics across Cabanatuan, Gapan, Muñoz, and San Jose in Nueva Ecija, Philippines.

■ MATERIALS AND METHODS

This retrospective study profiled canine heartworm disease (CHD) cases in Nueva Ecija, Philippines, from 2020 to 2022. Cases were confirmed using a 4-way rapid antigen test kit. Data on age, sex, breed, preventive medication history, and owner location were collected from clinics in Cabanatuan, Gapan, Muñoz, and San Jose. Clinics were contacted via email or social media with consent for participation. The records were reviewed in Excel for analysis. Descriptive statistics and proportion tests were applied to variables, including sex, breed, age, preventives, clinical signs, and medical history. Associations between variables and CHD occurrence were assessed using chi-square tests, with $p < 0.05$ considered significant. Seasons were classified by PAGASA as rainy (June–November) and dry (December–May), with dry divided into cool (December–February) and hot (March–May). Dogs were categorized as small, medium, or large.

■ RESULTS AND DISCUSSION

From 2020 to 2022, canine heartworm disease (CHD) was most prevalent in dogs aged ≥ 13 months (63.85%) and 7–12 months (29.02%). Age showed a significant association with CHD, as older dogs face higher exposure to infected mosquitoes (Montoya-Alonso *et al.*, 2017).

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Male dogs had higher infection rates (54.35%) than females (43.54%) due to outdoor behavior (Bacsadi *et al.*, 2016; Chikweto *et al.*, 2014). However, no significant sex-based association has been found.

Toy breeds showed the highest infection rate (62.27%), followed by mixed and working breeds. Although smaller breeds may seem more vulnerable to mosquito exposure, no significant association between breed and CHD has been detected (Montoya-Alonso *et al.*, 2017).

Most infected dogs (90.77%) did not use preventive heartworms. Consistent with Glickman *et al.* (2006), preventive measures significantly reduced the risk of infection. Limited awareness and inconsistent use remain key barriers to prevention.

Coughing (86.28%) was the most common sign, followed by dyspnea (48.02%), lethargy (46.70%), and inappetence (36.68%), reflecting the effects of CHD (McCall *et al.*, 2008; Ames & Atkins, 2020).

Infection peaked during the rainy season (June–November), correlating with mosquito activity (Huang *et al.*, 2013). Cabanatuan City had the highest incidence (304 cases), followed by Muñoz, Gapan, and San Jose. The local climate and vectors influenced these patterns.

Table 1 Profile of the animal based on groups, sex, and breed with heartworm disease on 2020 to 2022 in Nueva Ecija, Philippines

Parameters	Details	Frequency, (%)
Age	0-6 months	3, (0.79)
	7-12 months	110, (29.02)
	>13 months	242, (63.85)
	Unknown	24, (6.33)
	p-value	0.001
Sex	Female	165, (43.54)
	Male	26, (54.35)
	Unknown	8, (2.11)
	p-value	0.650
Breeds	Herding	1, (0.26)
	Hounds	1, (0.00)
	Non-Sporting	13, (3.43)
	Sporting	7, (1.85)
	Stray Dogs	35, (9.23)
	Terriers	0, (0.00)
	Toy	236, (62.27)
	Working	38, (10.03)
	Unknown	48, (12.66)
	p-value	0.530
Clinical Signs	Coughing	327, (86.28)
	Decreased Appetite	139, (36.68)
	Dyspnea	182, (48.02)
	Exercise Intolerance	40, (10.55)
	Lethargy	177, (46.70)
Seasons	Weight Loss	33, (8.71)
	Rainy (Jun-Nov)	214, (56.46)
	Cool dry (Dec-Feb)	93, (24.53)
	Hot dry (Mar-May)	72, (18.99)
	p-value	0.671
Municipalities	Cabanatuan	304, (80.21)
	Munoz	23, (6.06)
	Gapan	21, (4.22)
	San Jose	7, (1.84)
	p-value	0.028
Heart worm preventive	With	15, (3.96)
	Without	344, (90.77)

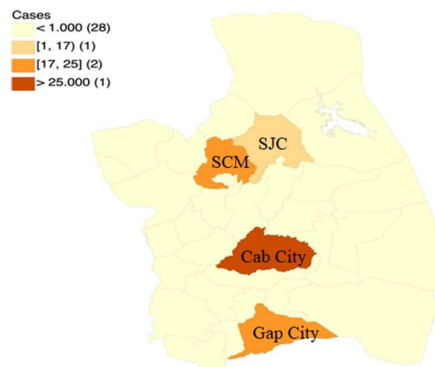


Figure 1 Spatial distribution of canine heartworm infection among dogs in veterinary clinics across Cabatuan, Gapan, Muñoz, and San Jose in Nueva Ecija, Philippines.

CONCLUSION

Canine heartworm disease was most prevalent in older unprotected dogs during Nueva Ecija's rainy season, highlighting the need for prevention and owner awareness.

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