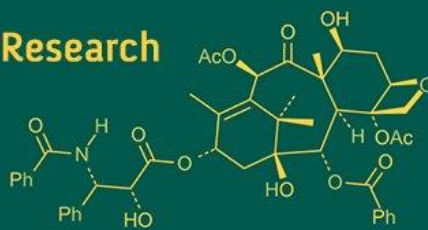


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Study on prevalence and clinical features of dilated cardiomyopathy in dogs in Mhow and Indore

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Abstract

Dilated cardiomyopathy (DCM) is one of the most common acquired cardiac diseases in dogs and is associated with significant morbidity and mortality. The present study was undertaken to determine the prevalence and clinical features of DCM in dogs presented to the Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Mhow and Indore, Madhya Pradesh, India. Out of a total of 1829 dogs presented during the study period, 147 dogs showing clinical signs suggestive of cardiac disease were further evaluated using electrocardiography, thoracic radiography and echocardiography for confirmatory diagnosis of DCM. The overall prevalence of DCM was found to be 0.82%. Age-wise prevalence was highest in dogs above eight years of age (1.27%), followed by dogs aged 5-8 years (0.95%), while no cases were recorded in dogs below four years. Sex-wise analysis revealed a higher prevalence in males (0.98%) compared to females (0.62%). Breed-wise distribution indicated Labrador Retriever as the most affected breed, followed by German Shepherd, Golden Retriever, Indian Spitz, Beagle and Doberman Pinscher. The most common clinical manifestations observed were lethargy (93.33%), exercise intolerance (86.66%), inappetence (66.66%) and laboured breathing (60%). Other signs included weight loss, tachypnoea, coughing, ascites and limb oedema. Rectal temperature remained within normal limits throughout the study period. A significant reduction in heart rate and pulse rate were observed between the 0th and 14th day, while respiration rate showed a significant decrease by the 14th day, likely due to reduced pulmonary congestion. The findings of the present study indicate that DCM is more prevalent in older, male and large-breed dogs, with non-specific but progressive clinical signs. Early recognition using appropriate diagnostic tools is essential for timely management and improved clinical outcomes.

Keywords: DCM, clinical findings, prevalence, dogs

Introduction

Canine cardiac diseases are common, and complex. Any cardiac abnormality needs to be dealt with priority to avoid morbidity and mortality (Kumar *et al.*, 2014) [6]. Dilated cardiomyopathy (DCM) is one of the most common acquired cardiovascular diseases of dogs, which is characterized by impaired myocardial contractility with dilation of the chambers of heart. The chambers of the heart increase in size and the muscles forming the walls of the heart become thinner, resulting in weakened contractions and poor pumping ability (Sisson, 2010) [11].

Cardiomegaly, as a consistent sign of heart disease, can be seen in cases of hypertrophic or dilated cardiomyopathy (Litster and Buchanan, 2000) [7]. Dilated cardiomyopathy is characterized by a weakened cardiac contractile force, dysfunction of the myocardium involving systolic and/or diastolic impairment, dilation of the ventricles, and the frequent presence of tachyarrhythmias.

Several studies suggest that giant and large breed dogs are more predisposed to DCM. Sex has also been identified as a predisposing factor for dilated cardiomyopathy, with male dogs showing a greater incidence of the disease. DCM in dogs is characterized by a prolonged preclinical stage, and dogs with DCM are difficult to diagnose in the preclinical stage. Once clinical signs develop, the period prior to referral is typically brief, and the associated survival outcomes are generally unfavourable.

In routine clinical settings, outside of organized breed-screening programs, dogs with dilated cardiomyopathy are most often identified only after they begin to show clinical signs or when abnormalities are detected during physical examination. Therefore, improved awareness of breed predispositions, characteristic clinical manifestations and key diagnostic indicators obtained through electrocardiography, radiography and echocardiography can facilitate earlier detection of this condition, which is typically associated with a brief symptomatic period. Considering the background study, the present study was planned to study the prevalence and clinical features of DCM in dogs in Mhow and Indore.

Materials and Methods

The present study was carried out during a period from July 2025 to December 2025 in the Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, Mhow, Madhya Pradesh, India. A total of 1829 dog cases were presented and 147 dogs were suspected with clinical signs involving exercise intolerance, Laboured breathing, tachpnoea, limb oedema, ascites, coughing and lethargy for various cardiac diseases. Then these suspected cases were screened further for confirmatory diagnosis with electrocardiography (Using 3-channel ECG machine Hygeia 3SV), radiography (Using MedRay 40) and echocardiography (using Wipro GE LOGIQ 5 colour Doppler ultrasound machine). ECG was performed using the standard limb leads and chest lead at 25 mm/s paper speed and interpreted as per the guidelines by Tilley *et al.* (2008) [15]. Thoracic radiograph was taken in right lateral recumbency and was based on the general principles outlined by Buchanan and Bucheler (1995) [2] and then Vertebral heart score is measured. The vertebral heart score more than 10.5 was considered for cardiomegaly. The M-Mode echocardiography was performed with a frequency range between 5.0 to 8.0 MHz as per standard protocols (Tilley *et al.*, 2008) [15].

All the information related to age, sex, breed and clinical signs was collected. The vital parameters were evaluated by one-way ANOVA as per the standard procedure outlined by Snedecor and Cochran (1994) [12].

Results

A total of 1829 dog cases were presented at the Veterinary Clinical Complex (VCC), College of Veterinary Science and A.H., Mhow and Indore. The prevalence of DCM was found to be 0.82%. The age-wise prevalence was found to be higher in dogs over 8 years of age (1.27%), followed by the age group of 5-8 years (0.95%) and then no positive case of DCM in the age group of 0-4 years (Table 01). The sex wise prevalence was recorded as 0.98% in males and 0.62% in females (Table 02). Among the total dogs, the breed-wise distribution indicated that Labrador retriever was more prone to DCM (0.27%), followed by German shepherd (0.22%), Golden retriever (0.11%) and Indian spitz (0.11%), Beagle (0.05%) and Doberman pinscher (0.05%) (Table 03).

Table 1: Age wise prevalence of DCM in dogs

Age group (years)	No. of dogs (Total)	No. of dogs (Positive)	Prevalence (%)
Upto 4	495	0	0.00
5 to 8	628	6	0.95
More than 8	706	9	1.27

Table 2: Sex wise prevalence of DCM in dogs

Sex	No. of dogs (Total)	No. of dogs (Positive)	Prevalence (%)
Male	1018	10	0.98
Female	811	05	0.62

Table 3: Breed wise prevalence of DCM in dogs (n = 1829)

Breeds	No. of dogs positive	Prevalence (%)
Labrador retriever	5	0.27
Golden retriever	2	0.11
German shepherd	4	0.22
Indian spitz	2	0.11
Beagle	1	0.05
Doberman pinscher	1	0.05

On clinical examination, the history of lethargy was recorded in 93.33% of cases followed by exercise intolerance (86.66%), inappetence (66.66%), laboured breathing (60%), weight loss (40%), tachypnoea (26.66%), coughing (20%), ascites (13.33%) and limb oedema (6.66%) (Table 04) (figure 01-03).

The mean value of rectal temperature (°F) was 101.81 ± 0.11 , which was within the normal range. The mean value of heart rate (bpm) was 127.00 ± 4.07 , which was higher than the normal physiological range. The mean values of pulse rate (bpm) and respiration rate were 123.75 ± 4.06 and 32.50 ± 1.92 , respectively, which were higher than the normal physiological range (Table 05).



Fig 1: German Shepherd dog showing sign of laboured breathing

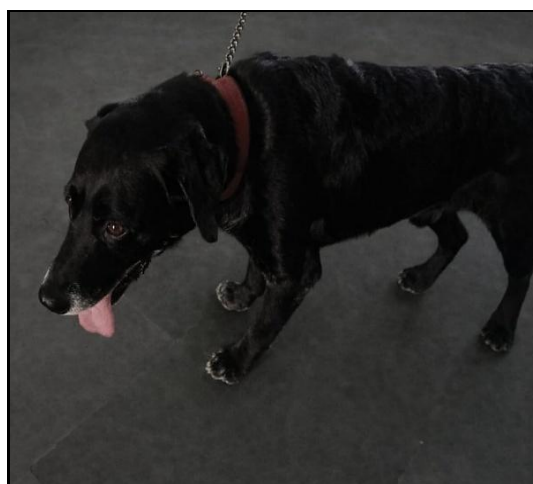


Fig 2: Labrador retriever dog showing signs of exercise intolerance



Fig 3: Labrador retriever dog showing sign of ascites

Table 4: Frequency of major clinical manifestations in dogs suffering from DCM ($n = 15$)

Clinical manifestation	No. of dogs having clinical signs	Frequency (%)
Exercise intolerance	13	86.66
Inappetence/anorexia	10	66.66
Lethargy	14	93.33
Coughing	03	20.00
Weight loss	06	40.00
Ascites	02	13.33
Laboured breathing/Dyspnoea	09	60.00
Limb oedema	01	06.66
Tachypnoea	04	26.66

Table 5: Mean values of rectal temperature, heart rate, pulse rate and respiration rate in DCM in dogs ($n = 08$)

Clinical parameters	Values
Rectal temperature ($^{\circ}\text{F}$)	101.81 ± 0.11
Heart rate (per min.)	127.00 ± 4.07
Pulse rate (per min.)	123.75 ± 4.06
Respiration rate (per min.)	32.50 ± 1.92

Discussion

In the present study the overall prevalence was found to be 0.82%, which aligns with the previous reports of overall prevalence of DCM between 0.5-1.1% as reported by Martin *et al.* (2009) [8]. Thirunavukkarasu (2019) also reported that the DCM in dogs is below 1%, which agrees with the present study.

The prevalence of DCM in dogs was higher in age group of more than eight years, that aligns with the findings of Wess *et al.* (2010) [19], whose study revealed that out of the positive cases, 88.7% were above six years of age, while 22.4% were identified in dogs between two and six years, with the condition being least frequent (3.3%) in those younger than two years. While Ben (2010) found increased occurrence in middle aged dogs. Among the confirmed cases, males were more susceptible to DCM than females. Male predominance was suggested by Serfass *et al.* (2006) [10]. However, Wess *et al.* (2010) [19] reported equal percentage of both male and female dogs affected. Among the different breeds, a higher prevalence of DCM was observed in Labrador Retriever followed by German shephard and golden retriever. The observation of higher

incidence in Labrador Retriever is in agreement with Pai 2009 [9] and Thangapandian *et al.* (2016) [14]. Most of the animals presented with this disease were pure pedigree dogs, this observation was similar to that made by Dukes-McEwan *et al.* (2003) [4]. The prevalence of DCM in certain breeds like Deerhounds, Dobermans, Irish Wolfhounds, Great Danes and Boxers was high in the other countries. The differences in the prevalence of breeds can be due to more population of certain breed in particular area.

Clinically DCM affected dogs showed several clinical signs such as exercise intolerance, lethargy, laboured breathing, coughing, ascites, tachypnoea and limb oedema. The similar clinical signs were observed by Van *et al.* (1981) [16] and Varshney *et al.* (2011) [17]. The onset of signs such as exercise intolerance, fainting episodes, coughing and vomiting is commonly associated with left-sided cardiac failure, while abdominal distension or the development of ascites is more indicative of right-sided heart failure (Ettinger and Feldman, 2005) [5].

Non significant changes were observed in rectal temperature. The similar findings were also observed by DeFrancesco (2002) [3]. Increased heart rate, pulse rate and respiration rate was observed in the initial presentation of dogs affected with DCM, Similar findings were observed by Sreenesh (2015) [13]. Increased heart rate is may be to compensate for the reduction stroke volume, the body activates the sympathetic nervous system, resulting in an increased heart rate, the pulse deficit can be because all heartbeats may not produce palpable pulses, leading to pulse deficits (Ettinger and Feldman, 2005) [5]. The increased respiration rate observed can be due to reduction in congestion and pulmonary oedema, these findings align with those reported by Pai (2009) [9].

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