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Occurrence of cardiac diseases in dogs: A retrospective study

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Abstract

The occurrence of *cardiac diseases* varies with different geographical locations according to the availability of breeds in their locality. The present report deals with the occurrence of different cardiac diseases in dogs presented to Teaching Veterinary Clinical Complex, Mannuthy. The study was carried out in the Department of Veterinary Clinical Medicine, Ethics Jurisprudence, College of Veterinary and Animal Sciences, Mannuthy during the period July, 2015 to July 2017. The overall occurrence of different cardiac diseases in dogs were 28.07 percent in the studied population. High occurrence of cardiac diseases were atrioventricular valvular diseases (45.6 percent) followed by dilated cardiomyopathy (43.85 percent). Male dogs were found to be dominating in the occurrence of cardiac diseases than females during the study period.

Keywords: Dilated cardiomyopathy, atrioventricular valve

Introduction

Dog is very obedient lovable animal that can easily understand the nature of a person due to their intelligence and can easily be adopted to the human habitant across the world. In growing urban cities, inhabitants of nuclear families rearing pets to relive their stress and loneliness. Pets have contributed physical, social and emotional wellbeing of their owners. So pet welfare has been a concern, as many owners very much caring about their pet health status. According to Atkins *et al.* 2009 [1] approximately 10% of dogs presented for primary care to veterinary hospitals have cardiac disease, and degenerative valvular disease is the most common cardiac disease of dogs. Cardiac diseases in dogs were serious and life threatening in nature and often present without our awareness or warning.

Acquired cardiac diseases are very common in geriatric dogs. Whereas congenital cardiac diseases were more common in young animals. Therefore, veterinarians should be aware of different cardiac diseases in their locality for its proper diagnosis and treatment. The present study was undertaken to determine the occurrence of different cardiac diseases in pet dogs.

Materials and Methods

This study was conducted in the Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary and Animal Sciences, Mannuthy during the period from July, 2015 to 2017. Dogs presented to the University Veterinary Hospital and Teaching Veterinary Clinical Complex, Mannuthy from different parts of Kerala with clinical signs suggestive of cardiac disease *viz.* cough, dyspnoea, exercise intolerance, weight loss, ascites, depression, lethargy, weakness, cyanosis and syncope formed the materials for the present study. They were subjected to detailed clinical examination. Based on the clinical examination, electrocardiographic, radiographic, haematobiochemical and echocardiographic studies cardiac disorders were confirmed. The data on breed, age and sex were collected for demographic studies during the study period (July 2015-2017).

Results and Discussion

During this period, 203 out of 13810 cases were suspected for cardiovascular diseases and 57 were confirmed with echocardiography.

Occurrence of cardiac diseases are presented in Fig 1. During the study period, 203 out of 13810 cases were suspected for cardiovascular diseases and 57 were confirmed cases of cardiac diseases (28.07 percent).

In this disease population, dilated cardiomyopathy (DCM) was 43.85 percent (25/57). Mitral and tricuspid valve disease were 35.08 percent (20/57) and 10.52 percent (6/57) respectively. Two cases had pericardial effusion (3.50 percent), one case had hypertrophic cardiomyopathy (1.75 percent). Congenital diseases accounted for only three cases with two cases diagnosed with subaortic stenosis (3.50 percent) and one case with patent ductus arteriosus (1.75 percent).

In the present study revealed, Mitral valve disease was found to be more in the age group 10-12 years of age. In the current study, DCM was found to be more in the age group of six to eight years (56 percent) followed by eight to ten years of age

group (24 percent) and that occurrence of DCM increases with age. The present findings agreed the observations made by Petric (2002) [13] where in which observed DCM was recorded at a mean age of 6.5 ± 1.9 years. Meurs *et al.* (2007) [9], Wess *et al.* (2010) [15] and Palermo *et al.* (2011) [11] were made similar observations. Aging process affects blood vessels and the heart. This process alters the response of beta-adrenergic receptors in myocardium and has selective effects on peripheral vascular function (altered response to SNS stimulation and catecholamines). These changes might contribute to an increase in the incidence of cardiac disease in older dogs (Bright and Mears, 1997) [2].

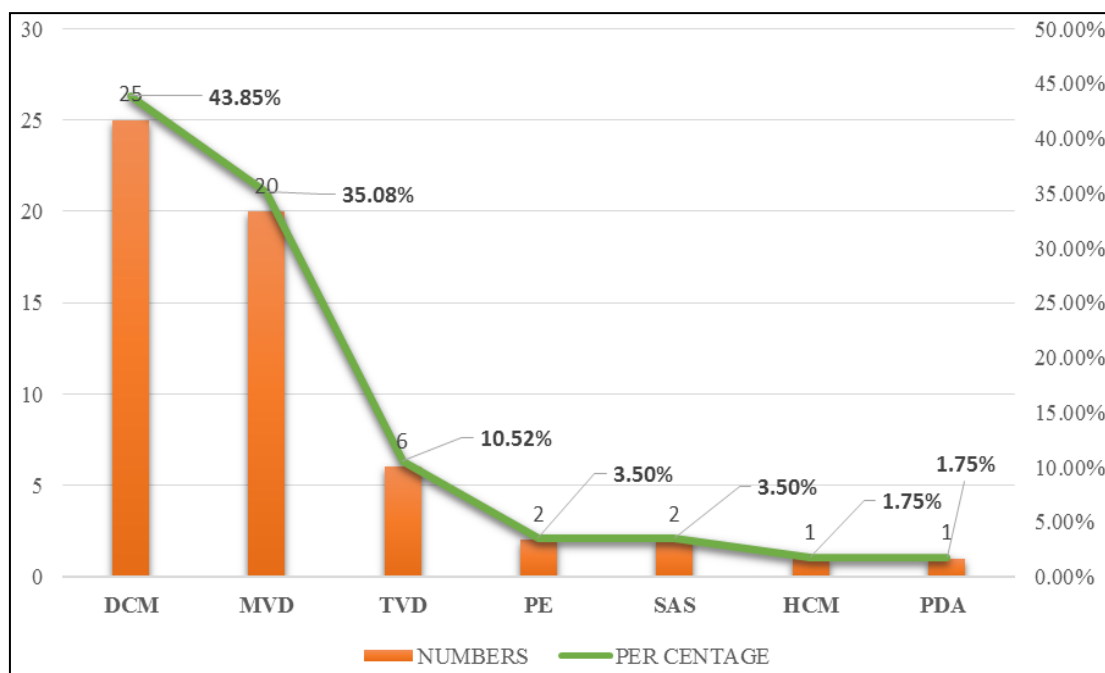


Fig 1: Occurrence of different cardiac diseases

(DCM-Dilated cardiomyopathy, MVD- Mitral Valve disease, TVD- Tricuspid valve disease, PE- Pericardial effusion, SAS-Subaortic stenosis, HCM- Hypertrophic cardiomyopathy, PDA- Patent ductus arteriosus)

Dogs affected with atrioventricular valve disease included small breeds. Small breeds include Spitz, Dachshunds and non-descript breed. In the present study, dogs affected with dilated cardiomyopathy included medium and large breeds. In this study, DCM was found to be more common in Labrador retrievers (56 percent) followed by Great Danes (12 percent), Rottweiler (8 percent), Basset hound (8 percent), Bull mastiff (8 percent), Beagle (4 percent) and Doberman (4 percent). The present findings were in accordance with the following authors (Pai, 2009; Devi, 2015; Sreenesh, 2015) [10, 14]. Increased occurrence of DCM in Labrador retrievers might be due to higher ownership of these breeds in our locality or inbreeding of poor breed lines (inherited). Hence more breed specific study is needed to prove the inheritance of the DCM in Labrador retriever.

Male dogs found to be dominating with the occurrence of cardiac diseases. Out of twenty five dogs diagnosed with DCM, nineteen (76 percent) were male and six (24 percent) were female. Male dogs were found to be dominating in the occurrence of DCM than females during the study period. These findings were in agreement with Petric *et al.* (2002), [9] *et al.* (2007), Martin *et al.* (2010) [6] and Sreenesh (2015) [14]

who stated that DCM was more common in males than female dogs. Male Dobermans showed early echocardiographic changes which was reported in a study conducted in Europe by Wess *et al.* (2010) [15].

Major clinical signs observed in dogs with atrioventricular valve disease were cough, tachypnea, exercise intolerance and syncope. In the present study, the major history and clinical signs in DCM were inappetance, abdominal enlargement, exercise intolerance, weakness, difficulty in respiration, syncope and vomiting. Inappetance was reported in high numbers in dogs with DCM, which was followed by abdominal enlargement, exercise intolerance, weakness, difficulty in respiration, syncope, cough and vomiting. The above findings were in agreement with following authors who also observed similar clinical signs in DCM affected dogs (Martin *et al.* 2009; Pai, 2009; Martin *et al.* 2010; Palermo *et al.*) [7, 10, 6, 11, 14]. In DCM patients, dyspnea preceded by tachypnea might be due to either pulmonary edema in left side heart failure or due to pleural effusion in right side heart failure. Poor cardiac output in dilated cardiomyopathy might be the reason for exercise intolerance, syncope and weakness. Murmurs heard on the auscultation of heart and crackles and wheezing sound heard on the lung area in dogs with degenerative atrioventricular valve disease. The predominant clinical examination findings of DCM in the present study

were murmur, increased heart rate, ascites, pulse deficit, cardiac cachexia and distension of jugular vein followed by other findings like pedal oedema. Atrial fibrillation might be the reason for pulse deficit in dogs with DCM. McEwan (2000)^[8], Jordan (2003)^[5], Martin *et al.* (2009)^[7], Pai (2009)^[10], Martin *et al.* (2010)^[6], Palermo *et al.* (2011)^[11] and Sreenesh (2015)^[14] also observed similar clinical examination findings in dogs with dilated cardiomyopathy. Statistically significant ($p \leq 0.01$) increase was noticed in the mean values of heart rate and pulse rate between apparently healthy and dogs with dilated cardiomyopathy. Pereira *et al.* (2016)^[12] reported mean values of heart rate in dogs with DCM were 147 ± 23 bpm. Statistically significant ($p \leq 0.01$) increase was noticed in the mean respiration rate between apparently healthy and dogs with dilated cardiomyopathy. It might be due to pulmonary edema in left sided heart failure, which stimulates pulmonary interstitium that further increases respiratory rate with or without the presence of hypoxia. Murmur might be due to regurgitation secondary to dilatation of heart; increased heart rate due to activation of sympathetic nervous system in dogs with DCM. In right-heart failure, increased sodium and water retention were the main reason for ascites and pedal oedema and distension of jugular vein was due to increased systemic venous pressure. Cardiac cachexia was characterized by loss of total body fat and lean body mass especially skeletal muscle despite of usual appetite and adequate therapy for the underlying cardiac disease. In conclusion, occurrence of cardiac diseases include atrioventricular valve were higher in small breeds and most commonly in spitz and dachshunds. Myocardial diseases include dilated cardiomyopathy were higher in medium to large breeds includes Labrador retrievers and great Danes. Other cardiac diseases observed were pericardial effusion, subaortic stenosis, hypertrophic cardiomyopathy and Patent ductus arteriosus.

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