RADIOGRAPHIC AND ELECTROCARDIOGRAPHIC CHANGES IN DOGS WITH DILATED CARDIOMYOPATHY

Himalini¹, S.K.Gupta², R.K. Bhardwaj¹, R. Singh³, J.S. Soodan and A.K. Gupta
¹Assistant Professor, ²Professor, ³Professor & Head, Division of Veterinary Medicine; F.V.Sc & A.H, SKUAST(J), R.S.Pura, Jammu-181102 (J&K).
[Received: 05.5.2016; Accepted: 08.11.2016]

Cardiac diseases in canine are an extensively studied phenomenon all over the world but meagre information has been reported in India. Investigations employing auscultations, roentgenograms, electrocardiography, echocardiography and Doppler echocardiography have revealed that spontaneous heart diseases are more prevalent in dogs than previously considered. The present study was conducted on the 6 dogs of different breeds presented to Clinics of Faculty of Veterinary & Animal Sciences, Jammu, between July 2012 and June 2013, with compliant of fainting/ syncopal episodes, cyanosis, cough reflex, oedema, ascitis and exercise intolerance. Dogs suspected for cardiovascular disorders were subjected to radiography and electrocardiography. Thoracic radiography done in left lateral and dorsoventral recumbency for lateral and dorsoventral view of the heart. Thoracic radiography with DCM revealed cardiomegaly, pulmonary venous congestion and interstitial edema. Bipolar Lead II electrocardiogram revealed increased duration of P wave. Increased R wave amplitude and ST segment coying.

Keywords: Radiography, Electrocardiography

Cardiac diseases in canine are an extensively studied phenomenon all over the world but meagre information has been reported in India. Recognition of certain cardiac diseases has been delayed and ignored on account of lack of awareness and knowledge by the owner and inadequate diagnostic facilities to a field veterinarian. During recent years cardiac diseases are being diagnosed with increasing frequency and are considered as an important health problem in dogs. Investigations employing auscultations, roentgenograms, electrocardiography, echocardiography and Doppler echocardiography have revealed that spontaneous heart diseases are more prevalent in dogs than previously considered (Sisson and Schaeffer, 1999).

Cardiomyopathies are defined as diseases of the myocardium associated with cardiac dysfunction (Richardson and Shirani, 1996). The new classification of cardiomyopathy by world health organization is by dominant pathophysiology or where possible, by etiological/ pathogenic factors (Richardson and Allen, 1996).

Dilated Cardiac Myopathy is characterized by a progressive systolic and diastolic myocardial dysfunction of unknown cause, which can be presented as asymptomatic, congestive heart failure or sudden death. It results in a thinning and deterioration of the heart muscle resulting in the inability of the heart to pump with sufficient force to maintain the body’s normal state. It is more prevalent in middle- aged to elderly patients and it appears to be more in males of some breeds (Dukes et al., 2000).

Materials and Methods

The present study was conducted on the 6 dogs of different breeds (3 Labrador, 2 German Shepherd and 1 Doberman) presented to Clinics of Faculty of Veterinary & Animal Sciences, Jammu between July 2012 and June 2013, with compliant of fainting/ syncopal episodes, cyanosis, cough reflex, oedema, ascitis and exercise intolerance. Age of affected dogs varied between 3–12 years. Clinical signs exhibited by dogs in general were exercise intolerance, syncopal episodes, cyanosis of the buccal mucosa, coughing, ascitis, mild to severe anaemia and cachexia. Heart diseases were graded based on New York Heart Association Insufficiency Score. A detailed auscultation of all the four quarters was done prior to electrocardiographic examination. Thoracic auscultation revealed heart sounds over a wider area, tachycardia with muffled heart sound without audible murmurs. The size and shape of chest and abdominal cavity were determined. All dogs suspected for cardiovascular disorders were subjected to radiography and electrocardiography. Thoracic radiography was done in left lateral and dorsoventral recumbency. The ECG was recorded with dog restrained in right lateral recumbency on using standard bipolar lead II.
Results and Discussion:
Thoracic radiography with DCM revealed cardiomegaly, pulmonary venous congestion and interstitial edema as also reported by Stevenson and Perloff (1988). Generalized globoid cardiomegaly is commonly seen in thoracic radiographs of dogs with advanced DCM. Out of 6 animals in which radiography was done 4 showed tracheal elevation. On examination of cardiac silhouette deviation from normal were seen. The normal range of VHS in Labrador and German Shepherd dogs are 10.31±0.25 and 10.37±0.31. However on measuring the size of silhouette, the mean values of VHS in Labrador and German Shepherd dogs was higher than the upper limit. VHS Lab. 12.28 ± 0.74 and VHS GSD 12.05 ± 0.92 indicating cardiac enlargement. Bipolar Lead II electrocardiogram revealed increased duration of P wave however amplitude was within normal range. The mean Pamp was 0.41 ± 0.02 mV and a range of 0.20 – 0.60 mV. Increased R wave amplitude and ST segment coving. The mean Ramp in the present study was recorded 1.98 ± 0.16 mV and a range of 1 – 3 mV. The mean value of Ramp was in agreement with findings of Bernal et al. (1995). Similar findings were reported by Kumar and Varshney (2010) the electrocardiographic findings were increased amplitude of R wave, bizarre QRS complex and ST segment coving. The mean QRS complex among dogs presented was found to be 0.05 ± 0.00 sec and ranged between 0.04 – 0.08 sec. The standard values for QRS complex in large breeds is reported as 0.06 sec and increased QRS complex duration is due to heart block or enlargement of left or right or both the ventricles. The term enlargement is generally used for hypertrophy and/ or dilatation of left ventricles as it is not easy to differentiate these conditions on the basis of ECG findings, however higher amplitude of QRS is most common finding of dilatation cardiomyopathy as per Starling’s law.

Fig.1. Electrocardiogram of a 7yr old Labrador with DCM (HR 155 bpm) (Paper speed 25mm/sec)

References
Richardson, R. and Shirani, D. (1996) A survey of electrocardiographic parameters of the precordial leads in Iranian German Shephard Dogs. Journal of the Faculty of Veterinary Medicine, University of