

ELECTOCARDIOGRAPIC CHANGES IN CATTLE WITH BOVINE BENIGN THEILERIOSIS

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Abstract: The aim of the study was to assess the electrocardiographic (ECG) changes in cattle with theileriosis of Puducherry region. The study revealed, only bovine benign theileriosis (BBT), which is caused by *Theileria orientalis* conformed by PCR. In the present study most of the animals suffer from subclinical or chronic form of disease which was indicated by the severe anemic haemogram. The ECG also showed the same picture by significant ($P < 0.05$) increase in the mean QRS amplitude (mV) and Q-T interval (sec) in cattle with theileriosis compared to their respective control mean. Other changes, like sinus tachycardia (62%), sinus bradycardia (12%), Shorten QRS wave (6%), atrial enlargement (9%) and tall T wave (6%) were also recorded..

Key words: Benign bovine Theileriosis, Cattle

INTRODUCTION

Electrocardiography is a non-invasive and easily applied technique used in the determination of cardiac dysfunction like cardiac hypertrophy and dilatation, classification of cardiac arrhythmias and diagnosis of conduction abnormalities in cattle, sheep, goat and dog. Bovine benign theileriosis (BBT) is a progressive lympho-proliferative disease characterized by fever, progressive anemia, lethargy, weakness, jaundice, abortion and mortality [1,2]. The aim was to study the electrocardiographic values and changes noticed in cattle with theileriosis.

MATERIALS AND METHOD

The ECG was recorded on a bipolar base apex using limb lead I. Animals were kept in a standing position in the travis without any tranquilizer or sedative. No clipping or shaving was carried out for the electric attachment. The ECG was recorded using alligator-

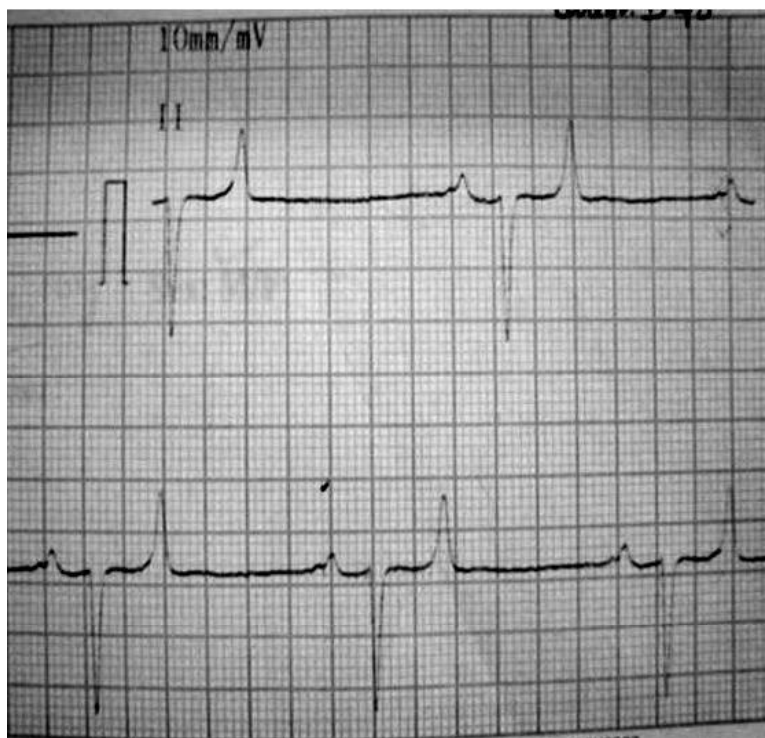
type electrodes which were attachment to the skin after cleaning it with alcohol and applying electrocardiographic jelly. The positive electrode lead I (left arm) was attached to the skin of the fifth-inter costal space just caudal to the olecranon, and the negative electrode (right arm) on the jugular furrow about 1/3 of the left side of the neck and the earth was attached away from these two electrodes (withier). All ECGs were obtained on a single channel ECG machine (Electrocardiograph Concept Bio-Medical, India. Type-ECG 300G) with paper speed 25mm/second and calibration of 10mm equal to 1mV. For measuring ECG parameters the traces were analyzed using a magnifying lens, by this method of measuring the precision of duration was 0.02 second and amplitude was 1.0mV. Heart rate was calculated by measuring the average of six R-R intervals of each trace as the animals were more relaxed at the end of the recording [3]. The haematology was estimated as per the standard methods of Schalm et al. [4].

Table. 1: The mean electrocardiographic values of apparently healthy cattle and cattle with theileriosis. ** Significant (P<0.01), * Significant (P<0.05), NS- Not Significant (P>0.05)

Parameters	Apparently healthy cattle (n=10)	Cattle with theileriosis (n=100)	"t"
P wave amplitude (mV)	0.21±0.03	0.23±0.01	0.77 ^{NS}
P wave duration (sec)	0.07±0.008	0.08±0.003	0.24 ^{NS}
QRS amplitude (mV)	0.78±0.11	1.12±0.6	2.65*
QRS duration (sec)	0.06±0.005	0.07±0.002	1.42 ^{NS}
P-R duration (sec)	0.2±0.02	0.23±0.007	1.77 ^{NS}
Q-T interval (sec)	0.4±0.01	0.37±0.007	1.8*
T wave amplitude (mV)	0.42±0.06	0.42±0.02	0.02 ^{NS}
T wave duration (sec)	0.12±0.01	0.11±0.007	0.19 ^{NS}

** Significant (P<0.01), * Significant (P<0.05), NS- Not Significant (P>0.05)

Fig. 1: Bradycardia with increase in QRS amplitude and QT interval. The figure showed increase in QRS amplitude and QT interval with bradycardia in animal suffering from severe anemia.



RESULT

The mean electrocardiographic values of apparently healthy cattle and cattle with theileriosis were presented in Table 1. There was a significant (P<0.05) increase in the mean QRS amplitude (mV) and Q-T interval (sec) in cattle with theileriosis as compared to their respective control (Fig.1). Ventricular hypertrophy (69 percent) was noticed in cattle with theileriosis. There was no significant difference in mean P value (amplitude and duration), QS duration, P-R duration and T wave (amplitude and duration) to the respective mean values between apparently healthy animals and cattle with theileriosis. In the

present study the commonly recorded findings were sinus tachycardia (62%), sinus bradycardia (12%), Shorten QRS wave (6%), atrial enlargement (9%) and tall T wave (6%) in cattle with theileriosis.

DISCUSSION

Cattle with theileriosis showed an increased in QRS amplitude (mV) and Q-T interval (sec) was indicative of ventricular hypertrophy attributed to a chronic form of anemia [5], which was very much clear in the present study that there was a significant (P<0.05) decrease in mean Hb(g/dl), PCV (%), RBC (10⁶cells/mm³) and MCV (fl). Commonly findings were sinus

tachycardia (62%), sinus bradycardia (12%), Shorten QRS wave (6%), atrial enlargement (9%) and tall T wave (6%) in cattle with theileriosis. Similarly Hasanpour et al. [6] in their ECG studies, carried out in 20 buffaloes affected with theileriosis, showed atrial premature beat in 3 cases, sinus tachycardia in 2 cases, sinus arrhythmia in 2 cases and first degree atrio-ventricular block in one case.

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