Journal of Veterinary and Animal Sciences, 33 (2002) 19-22

ELECTROCARDIOGRAPHIC STUDIES IN DIFFERENT BREEDS OF DOGS*

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Electrocardiogram is used in the diagnosis of cardiac arrythmias, cardiac chamber enlargement, cardiac monitoring before and after surgery, electrolyte imbalances and evaluation of cardiac drugs.

Though the normal canine electrocardiogram was established during late 1940's, many scientists have reported variations in canine ECG pattern because of the wide variation in body conformation and breeds of dogs. Hence, in the present study an attempt has been made to study the ECG pattern in different breeds of dogs.

Materials and Methods

Seventy two healthy dogs from three breeds namely German Shepherds, Dobermann Pinschers and Labrador Retrievers were used in this study. Twenty four dogs from each breed were studied.

Electrocardiogram was recorded in standard bipolar leads at paper speed of 25 mm/sec. using Cardiart 108T-MK-VI, a single channel, 12 lead Electrocardiograph (BPL India Ltd.) as per the procedure described by Tilley (1992). The Cardiart ECG recording paper (BPL India Ltd.) a thermo-sensitive paper of 50 mm width with a recording width of 40 mm was used. The heart rate was calculated using lead II recording strip as per the procedure by Tilley (1992).

Results and Discussions

Significant difference ($P<0.05$) was observed between the breeds with respect to heart rate. The mean heart rate was highest in Dobermann Pinschers (137±27 beats per minute) followed by Labrador Retrievers (125±32 beats per minute) and German Shepherds (115±20 beats per minute) respectively. The heart rate in German Shepherds ranged from 80-150 beats per minute which is in accordance with the findings of Rezakhani *et al.* (1990) who reported a mean heart rate of 110±20 (65-150) beats per minute.

** Part of MVSc Thesis in Veterinary Medicine submitted by first author to Veterinary College, UAS, Hebbal, Bangalore*

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The mean electrocardiographic values for different breeds are given in Table 1.

ECG pattern in different breeds of dogs has been depicted in Figs.1-3.

Table 1. Mean Electrocardiographic values in different breeds of dogs

Breeds	P Wave		PR interval (Sec)	QRS complex Dur (Sec.)	R Wave AMP (mv)	T wave Amp (mv)	QT interval Dur (Sec)	Mean Electrical (Axis (°)
	Dur (Sec.)	Amp (Sec.)						
German Shepherds	0.039± 0.003	0.112± 0.044	0.098± 0.018	0.04± 0.004	1.725± 0.582	0.132± 0.057	0.162± 0.022	85±11
Dobermann Pinschers	0.04	0.119± 0.038	0.098± 0.016	0.04± 0.004	1.616± 0.474	0.142± 0.066	0.16± 0.012	72±18
Labrador Retrievers	0.04	0.119± 0.045	0.104± 0.010	0.04	1.583± 0.457	0.121± 0.048	0.179± 0.029	63±17

Dur - Duration Amp - Amplitude Sec - Second

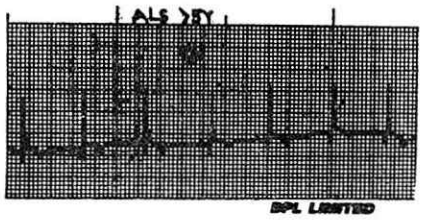

Fig. 1 ECG pattern in a German Shepherd

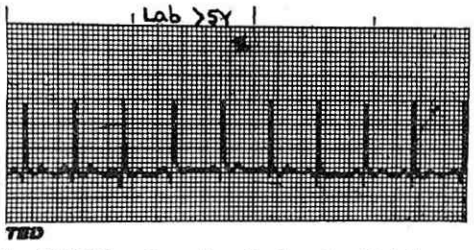

Fig. 3 ECG pattern in a Labrador Retriever

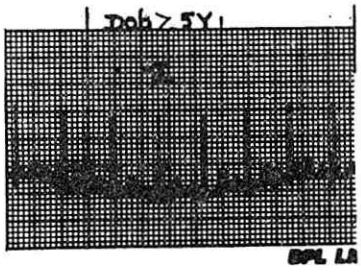

Fig. 2 ECG pattern in a Dobermann Pinscher

No significant difference (P>0.05) was observed between the breeds with respect to duration and amplitude of P wave, R wave and T wave. Similarly significant difference (P>0.05) was not observed with respect to duration of PR interval and ST segment.

Significant difference ($P<0.05$) was observed with respect to duration of QT interval. The mean QT interval in German Shepherds in the present study was 0.162±0.022 sec, which is confirming the findings of Plommet (1952), Pouchelon *et al.* (1973) and Rezakhani *et al.* (1990). The mean QT interval in Dobermann Pinschers and Labrador Retrievers were 0.16±0.012 and 0.179±0.029 seconds respectively.

Q wave, S wave and ST segment (elevation and depression) are considered as variable parameters in ECG as there is no consistency in occurrence of these among various breeds (Table 2).

The percentage occurrence of Q wave in German Shepherds in the present study was 91.66 per cent though Rezakhani *et al.* (1990) have recorded the same in 98 per cent of dogs in their study.

In the current study, S wave was present in 41.66 per cent of German Shepherds whereas Rezakhani *et al.* (1990) have reported S wave in 31.25 per cent in their study.

Significant difference ($P<0.05$) was observed between the breeds with respect to mean electrical axis.

Table 2 Observations on variable ECG parameters in different breeds of dogs (Lead II)

Breeds	Q Wave		S Wave		ST Segment			
	% occur-rence	Mean Amp (mv)	% occur-rence	Mean Amp (mv)	Elevation		Depression	
					% occur-rence	Mean Amp (mv)	% occur-rence	Mean Amp (mv)
German Shepherds	91.66	0.404± 0.306	41.66	0.16± 0.08	29.16	0.1	20.83	0.1
Dobermann Pinschers	100	0.392± 0.25	58.33	0.3± 0.169	-	-	50	0.125± 0.043
Labrador Retrievers	83.33	0.46± 0.32	54.16	0.338± 0.19	4.16	0.1	29.16	0.114± 0.034

Summary

Seventy two healthy dogs of three different breeds were used to study the ECG pattern. Significant difference ($P<0.05$) was observed between the breeds with respect to heart rate, duration of QT interval and mean electrical axis. The heart rate was highest in Dobermann Pinschers followed by Labrador Retrievers and German Shepherds respectively. The QT interval was longest in Labrador Retrievers. The mean electrical axis was highest in German Shepherds, followed by Dobermann Pinschers and Labrador Retrievers.

Acknowledgement

Authors wish to record their thanks to Dr. S.A. Rahman, Director of Instruction, Veterinary College, UAS, Hebbal, Bangalore for providing necessary facilities.

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