

ELECTROCARDIOGRAPHY IN CAPTIVE ASIATIC ELEPHANTS

A Preliminary study *

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The limitations in physical methods of diagnosis of cardiac disorders in elephants necessitates the use of diagnostic technique like ECG. Although plenty of literatures are available related to the ECG parameters in species like canine, feline, equine, bovine etc., little information are available in captive elephants.

ABSTRACT

Electrocardiography was carried out in twenty five elephants reared in various temples of Tamilnadu state, using Cardiart 508 model(BPL).Among the multiple leads taken, the lead I was selected for the study. The duration and amplitude of various compartments like P wave, QRS complex and T wave were documented including the PR interval and QT interval. The results were analysed.

Key word: Elephant – Electrocardiogram – Lead I

Twenty five captive elephants reared in different temples of Tamilnadu state were subjected for electrocardiographic examination using Cardiart 508 Model (BPL), with 50

Hz notch filter. During investigatory procedures in each elephant, the help of mahout was utilized for better control of the elephant. The area above elbow in forelimb was cleaned with cotton and ECG gel was applied liberally to facilitate the proper conduction of electrical charges. The skin just above stifle was prepared in a similar manner and the medial aspects of limbs as high as possible were used for placement of electrodes. The speed of the ECG paper was set at 25 mm per second and leads I,II,III,aVR and

aVF were recorded. Lead I was selected for analysis of P-QRS-T waves

The mean + SE of amplitude of P,R and T waves were 0.04 + 0.00mV, 0.28+ 0.02Mv and 0.04+0.01mV respectively. The mean + SE of P wave duration, QRS duration, PR interval and QT interval were 0.05+ 0.01 sec, 0.06+0.00 sec, 0.13+0.04 sec and 0.21+ 0.05 sec respectively. The occurrence of P wave at low amplitude in this study was in agreement to the reports given by Wallach and Boever (1983) and the overall mean R amplitude was in agreement to the values obtained by Jayasinghe and Britobabapulle (1961). Jayasinghe *et al* (1963) opined that low amplitude of R wave as obtained in this study was

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assigned to the greater thickness of the skin of the elephants which was associated with low conductivity. The overall mean values of PR and QT intervals obtained in this study were however found to be higher than the minimal values quoted in the range with regard to those values in canines, as quoted by Tilley (1992). The longer path of the impulse conduction and greater muscle mass as suggested by Mikota *et al* (1994) could be attributed to such variations. To concur with the result of this study, Jayasinghe *et al* (1964) quoted that T wave might be inverted and low in lead I. However, no inverted T waves occurred in this study.

It may be concluded that the routinely used electrocardiograph may not provide diagnostic electrocardiogram in elephants satisfactorily, owing to greater thickness of skin. Special / Improved electrode and suitable amplifiers may be used in future to improve the efficiency of electrocardiography application in elephants.

ACKNOWLEDGEMENT

The support given by temple authorities, mahouts, local veterinarians of the Department of Animal Husbandry, Tamilnadu state and the facilities provided by the Dean, Faculty of Basic Sciences and the Dean, Madras Veterinary College are greatly acknowledged.

REFERENCES

- Jayasinghe, J.B. and Britobabapulle, I.A.P. (1961). A report on an electrocardiogram of the Ceylon elephant. *Ceylon Veterinary Journal*. 9: 69-70
- Jayasinghe, J.B., Fernando, S.D.A. and Britobabapulle, I.A.P. (1963). The electrocardiographic patterns of *Elephas maximus* – The elephant of Ceylon. *British Veterinary Journal*, 119:559-564.
- Jayasinghe, J.B., Fernando, S.D.A. and Britobabapulle, I.A.P. (1964). The electrocardiogram of baby elephant. *American Heart Journal*. 67:388-390.
- Mikota, S.K., Sergent, E.I. and Ranglack, G.S. (1994). *Medical Management of the Elephant*. Indira Publishing House, USA. p. 107-118.
- Tilley, I.P. (1992). *Essentials of Canine and Feline Electrocardiography Interpretation and treatment*. 3rd edn. Lea and Febiger, USA. p. 44-45, 49
- Wallach, J.D. and Boever, W.J. (1983). *Diseases of Exotic Animals*. W.B.Saunders company, Philadelphia. p. 765-768.