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Innervation to the Esophagus of Black Bengal Goat

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Abstract: To study the innervation to the esophagus of Black Bengal goat a research was conducted in the Department of Anatomy and Histology, BAU, Mymensingh-2202, Bangladesh with 12 Black Bengal goats. All specimens were collected from adult Black Bengal goats (over 6 months of age); irrespective of sex. The esophagus of Black Bengal goat was sampled at six sites- Cranial cervical, middle cervical, caudal cervical, at the level of thoracic inlet, at the middle mediastinum and at the level of cardia. The nerves supplying the upper third of cervical esophagus by the pharyngoesophageal branch of vagus. The caudal two-third of cervical esophagus was innervated by the recurrent laryngeal nerve. The thoracic part of the esophagus was supplied by the recurrent laryngeal nerve and the dorsal esophageal branch of the vagus. The dorsal vagal trunk innervated the esophagus from the heart to the cardia.

Key words: Esophagus, innervation, black bengal goat

INTRODUCTION

Innervation to the esophagus of goat is an important study in anatomical research as it the important organ of digestive system having several complications like faulty drug administration through stomach tube, choke, esophagitis, tracheoesophageal fistula and esophageal structure etc. As in Bangladesh, Black Bengal goat is considered as a pure breed and several problems of esophagus is common in field condition, it is obligatory to know the innervation of esophagus. But there is no information available on the innervation to the esophagus of Black Bengal goat yet in Bangladesh. Thus, it is expected that the present study will be helpful for anatomists, veterinary practitioners, anesthesiologists, goat researchers as well as autonomous learners.

MATERIALS AND METHODS

A total of 12 Black Bengal goat were sacrificed to study the innervation of esophagus in Black Bengal goat in the Department of Anatomy and Histology, Bangladesh Agricultural University, Mymensingh. All specimens were collected from adult Black Bengal goats (over 6 months of age); irrespective of sex. The animals were purchased from

local markets, near the BAU, Mymensingh. Just prior to kill, the animals were weighted after fasting for 12 h. The animals were bled to death by dissecting the left common carotid artery, through which the fixing solution containing 10% formalin, 1% phenol and 0.05% glycerin was injected for fixation. Fresh esophagus was collected immediately after slaughtering the animals. Dissecting microscope and magnifying glass were used to follow the finer branches of nerves. The results were recorded and photograph from the selected area of gross specimen was placed.

RESULTS AND DISCUSSION

In Black Bengal goat, the pharyngoesophageal branch of vagus nerve innervated the upper third of cervical esophagus. The thoracic part of the esophagus was innervated by the recurrent laryngeal nerve and the dorsal esophageal branch of the vagus (Fig. 1). The dorsal vagal trunk innervated the esophagus from the heart to the cardia. These observations were similar to Getty^[1] and Dougherty *et al.*^[2] in ruminants. The vagus, glossopharyngeal and sympathetic nerve supply the esophagus in horse^[3]. Hwang *et al.*^[4] reported that the cervical portion was innervated by the



Fig. 1: Innervation of esophagus showing the left recurrent laryngeal nerve (LR), dorsal vagal trunk of left vagus (Lv), vagus nerve (V), esophagus (E), heart (H) and thoracic aorta (TA)

pharyngoesophageal nerve in dog. Dougherty *et al.*^[2] reported in ruminants that the pharyngoesophageal branch of vagus nerve innervated the upper third of cervical esophagus. Chauveau^[3] stated that recurrent laryngeal nerve supplied the cervical and thoracic part of esophagus. The dorsal and ventral branches of vagi and vagal trunk supplied the esophagus caudal to the heart in dog^[6]. On the other hand, the nerves of esophagus were derived from the sympathetic and parasympathetic nervous system via the cervical and thoracic chain and the vagus nerve in human, respectively^[7].

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REFERENCES

1. Getty, R., 1975. Sisson and Grossman's The Anatomy of the Domestic Animals. Vol. 1. 5th Edn. Philadelphia, W.B. Saunders Company, pp: 881-884.
2. Daugherty, R.W., R.E. Habel and H.E. Bond, 1958. Esophageal innervation and the eructation reflex in sheep. *Am. J. Vet. Res.*, 19: 115-128.
3. Getty, R., 1910. *Veterinary Anatomy*. Philadelphia, W.B. Saunders Company.
4. Hwang, K.M.I. Grossman and A.C. Ivy, 1948. Nervous Control of the Cervical Portion of the Esophagus. *Amer. J. Physiol.*, 154: 343-357.
5. Chauveau, A., 1986. *The Comparative Anatomy of the Domestic Animals*. New York, D. Appleton and Co. USA.
6. Miller, M.E., G.C. Christensen and H.W. Evans, 1964. *Anatomy of the Dog*, W.B. Saunders Co. Philadelphia, London, pp: 664-667.
7. Williams, P.L., L.H. Bannister, M.M. Berry, P. Collins, M. Dyson and J.E. Dussek, 1995. *Gray's Anatomy*. 38th Edn. Pearson Professional Limited; Livingstone Churchill, pp: 1751-1753.