

Distribution and role of myenteric nitrinergic neurons in the horse esophagus

Saverio M. Peirone*, Graziana Gambino*, Guido Filogamo**

* Dept. Veterinary Morphophysiology, University of Turin, Via Leonardo da Vinci 44 10095 - Grugliasco - Torino

** Dept. of Human Anatomy, Pharmacology and Phorensic Medicine, University of Turin, Corso Massimo d'Azeglio 52 - 10100 - Torino.

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SUMMARY

Previous research has shown that intrinsic neurons are numerous in esophagus walls where they play a role in the innervation of the musculature. The distribution of these neurons has not been studied in detail and their contribution to the musculature is not well known. This study was carried out on the myenteric plexus of the horse esophagus using the computerized reconstruction of serial sections of the wall. The observations revealed that the plexus has the same cellular distribution and the same quantitative order along the entire course of the organ. The nerve cells were double stained in order to reveal all neuronal elements (PGP9.5), including nitrinergic ones (revealed by NADPH-diaphorase reaction). The latter are 93% of the total neurons. Furthermore, in the sections of striated muscular wall varicose nitrinergic nerve fibres were found in association with motor-end plates. Analogous fibres run along the smooth esophageal muscle cells in a soft widespread nitrinergic environment.

Staining and sizing of the nitrinergic neurons involves dividing them into two classes: large neurons with a more intense reaction, and secondly, smaller less markedly stained neurons. Analysis of the shape factors ascribes the larger part of the nitrinergic neurons to Dogiel type II and a smaller quantity to type I. From the observations in this study and the data presented in the literature, it was concluded that the NADPH-d positive neurons contribute to the contractile function of the esophagus musculature modulating the signals from the CNS, locally regulating the peristaltic activity of the esophageal wall.