

II. THE IMMUNOHISTOCHEMICAL STUDY: MORPHOLOGY OF THE CARDIAC NERVE PLEXUS ON THE RABBIT HEART BASE

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Abstract. The purpose of this study was to investigate the neurochemistry of the epicardiac ganglionated nerve plexus in the whole-mount preparations of the rabbit atria, because the intrinsic cardiac nervous system of the rabbit has not been investigated so far. The cardiac nerve structures were revealed by the immunofluorescence labelling the choline acetyltransferase (ChAT), the tyrosine hydroxylase (TH) and the neuronal nitric oxide synthase (nNOS) in whole-mount atrial preparations derived from 10 young rabbits. The somata of the intrinsic cardiac neurons (ICNs) displayed the immunoreactivity for ChAT and nNOS. The TH-IR was not observed in the somata of the ICNs. The majority of the ICNs were immunoreactive for ChAT (52±11 %), the small population of the ICNs (19±16 %) exhibited the immunoreactivity for nNOS and 30±5 % of the ICNs were biphenotypic for ChAT and nNOS. The mean number of the ChAT-IR neurons was statistically significantly bigger than the mean number of both the nNOS-IR and the biphenotypic neurons ($P<0.05$). The ChAT-IR neurons were surrounded by the baskets of the ChAT-IR varicose nerve terminals. The nNOS-IR nerve fibres did not form pericellular complexes with nNOS-IR or ChAT-IR neurons. The singular varicose TH-IR nerve terminals were observed within ganglia but did not form pericellular complexes with ChAT-IR neurons. The extrinsic cardiac nerves entering the heart base were predominantly composed of the TH-IR nerve fibres that spread in the left atrium. The sparse ChAT-IR nerve fibres proceeded on the heart base toward the large intrinsic ganglia and on the epicardium towards the root of the right cranial vein (RCV). We concluded that the lack of the TH-IR ICNs within ganglia and lack of the mesh-work of the extrinsic nNOS-IR nerve fibres within the rabbit epicardiac ganglionated nerve plexus may support the hypothetic increase of reactivity to the rabbit coronary vessels to the effects of the catecholamines released by the adrenal medulla during the stress.

Keywords: intrinsic cardiac neurons, rabbit, tyrosine hydroxylase, choline acetyltransferase, neuronal nitric oxide synthase