

Analysis of Expression of SP and NOS in the Porcine Nodose Ganglion (NG) Sensory Neurons Supplying Prepyloric Stomach Region after Intra-gastric Hydrochloric Acid Infusion

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Abstract : One of the diseases that are very common health problem of modern man is the stomach hyperacidity. It is well known that this pathological state, during which gastric glands secrete too much of hydrochloric acid can be caused due to various factors such as stress, eating habits, alcohol, smoking and some, especially anti-inflammatory drugs. Moreover, hyperacidity is recognized as one of factors leading to development of peptic ulcer disease. Therefore, we analyzed expression of substance P (SP) and neuronal isoform of nitric oxide synthase (nNOS) in the porcine nodose ganglion sensory neurons innervating prepyloric stomach region in physiological state and following intra-gastric infusion of hydrochloric acid. The study was performed on 8 immature gilts of the Large White Polish breed. All animals were injected retrograde marker Fast Blue (FB) into the anterior prepyloric stomach wall. After injections of FB, pigs were divided into two groups: control (group C; n = 4) and experimental (HCL group, n = 4) and after convalescence period of 23 days, animals of HCL group were subjected to renewed anaesthesia. Then, 0.25 M aqueous solution of hydrochloric acid with a dose of 5 ml/kg body weight was administered intra-gastrically with use of a stomach tube. On 28th day, all control and HCL pigs were euthanized and bilateral right (rNG) and left (lNG) were collected. Cryostat sections were processed for double immunofluorescence using antibodies against SP and NOS. Immunofluorescence staining in the even-numbered ganglia nodes showed the presence of FB-positive cells expressing SP ($45,9 \pm 3,38\%$ in rNG and $60,4 \pm 1,71\%$ in lNG), and nNOS ($34,9 \pm 6,83\%$ in rNG and $49,9 \pm 9,32\%$ in lNG). In HCL group increased expression of both SP ($54,8 \pm 5,34\%$ in rNG and $56,9 \pm 3,28\%$ in lNG) as well as nNOS ($54,9 \pm 4,45\%$ in rNG and $52,5 \pm 2,17\%$ in lNG) in FB+ perikaria was found. The acquired results suggest that SP and nNOS are neurotransmitters and/or neuromodulators participating in the sensory regulation of the prepyloric region of porcine stomach function as well as their potential role in development of the stomach inflammatory state.

Keywords : nNOS, nodose ganglion, pig, SP

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