Tinctorial Changes in Neurons of Thoracic Spinal Ganglia After Experimental Cholecystectomy

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Abstract: *The questions of the innervation connections of neurons in the spinal ganglia with internal organs under normal conditions, in experiments, in clinical practice, and across age groups are the subject of study by morphologists in the current century. The involvement of these neurons in the afferent innervation of the gallbladder and other gastrointestinal organs has been studied. Their connections with other systems of the body have also been established.*

Considering that the number of diseases of the biliary system is increasing worldwide, with pain and its irradiation being one of the leading symptoms, it becomes clear why researchers are interested in studying this issue. According to some studies, surgical interventions related to diseases of the biliary system rank second in frequency after appendectomy.

However, the retrograde response of afferent system neurons, particularly those in the spinal ganglia, to gallbladder removal remains poorly understood. This situation, to some extent, justifies the relevance of our research.

Keywords: *ampulla of Vater, relief structures of the mucous membrane.*

The aim of the study: To investigate the morphology of neurons in the 6th-7th thoracic spinal ganglia of rabbits following experimental cholecystectomy.

Material and Methods: The material for the study consisted of the 6th-7th thoracic spinal ganglia on both sides from 4 control and 11 experimental rabbits

following different time points after experimental cholecystectomy. Cholecystectomy was performed under ethaminal sodium anesthesia. On the 3rd and 5th days after the experiment, the animals were euthanized under the same anesthesia, strictly adhering to bioethical guidelines.

The ganglia on the other side were embedded in paraffin according to standard procedures, and paraffin sections were stained using the Nissl method and hematoxylin-eosin. When studying the proportion of neurons with varying degrees of staining, we counted only those neurons in which the nucleus was clearly visible, since not all neurons appear intact in the sections. The number of hyperchromic neurons was counted in transverse sections of the ganglia.

Results of the Study: In the preparations of control rabbits, neurons in the spinal ganglia are clearly visible, with distinct boundaries between the nucleus and cytoplasm. The neurons are arranged in groups at the periphery of the ganglia. Around the neurons, the nuclei of Schwann cells can be seen.

Within the perikaryon of the neurons, clumps of Nissl substance are visible, brightly stained blue, varying in size and shape. This pattern is observed both with Nissl and hematoxylin-eosin staining as well as with Lasky staining. With Lasky staining, the neurons are clearly visible. In all of these methods, the number of hyperchromic neurons is very small.

At early time points after cholecystectomy, there is an increase in the number of hyperchromic neurons. They are primarily located at the periphery of the ganglia. The Nissl substance in their cytoplasm becomes finely granular and stains dark blue. The nuclei of glial cells surrounding the neurons also become hyperchromic.

On the 5th day after the experiment, cells with signs of tigrolisis are observed. In rare cases, a light pericellular halo around individual neurons can be seen. The shape of hyperchromic cells is mostly round, rarely oval. The distribution of Nissl substance in the cytoplasm of such neurons is homogeneous.

Conclusion: The number of hyperchromic nerve cells in preparations from the spinal ganglia of control rabbits ranges from 2 to 4 per microscopic field of

view. On the 3rd day after the experiment, this number increases to 8-11. On the 5th day after the experiment, the average number of hyperchromic neurons is between 7 and 8 in one transverse section of the spinal ganglion.

Thus, experimental cholecystectomy leads to a retrograde reaction in a specific number of neurons in the 6th-7th thoracic spinal ganglia, which is expressed in changes in their staining properties and the distribution of Nissl substance in their cytoplasm. We hypothesize that, after gallbladder removal, there is transection of the dendrites of neurons in the spinal ganglia involved in afferent innervation of the gallbladder.

The staining changes in the neurons, due to the redistribution of Nissl substance and subsequent changes in their metabolism, represent a retrograde reaction of these neurons in the spinal ganglia to the transection of their dendrites involved in the afferent innervation of the gallbladder.

List of References:

1.Dekhkanov T. D., Blinova S.A. at all., Variability in Intramural Ganglia and Efferent Neurons Along the Different Routes of the Bile Extraction System, American Journal of Medicine and Medical Sciences p-ISSN: 2165-901X e-ISSN: 2165-9036. 2023; 13(11): 1821-1824.

2.Rakhmonov Z.M., Oripov F.S., Dekhkanov T.D. Gross and Microscopic Anatomy of the Vater Papilla (Hepatopancreatice Ampule) in Animals with and without Gall Bladder/ American Journal of Medicine and Medical Sciences, 2020. 10 (1). C. 55-58.

3.Rakhmonova H.N., Rakhmonov Z. M. at all. Morpho-Functional Changes in Neurons of Spinal Nodes after Experimental Cholecystectomy in Mongrel Dogs, American Journal of Medicine and Medical Sciences p-ISSN: 2165-901X e-ISSN: 2165-9036 2023; 13(12): 1904-1907.

4. Briskin B.S., Ektov P.V., Kartsev A.G., Ivanova A.E., Klimenko Yu.F. Retroduodenal Perforations During Endoscopic Dissection of the Major Duodenal Papilla. // Endoscopic Surgery. – 2023. – No. 1. – P. 30-35.