POLISH JOURNAL OF SCIENCE
№61 (2023)

ISSN 3353-2389

Polish journal of science:

- has been founded by a council of scientists, with the aim of helping the knowledge and scientific achievements to contribute to the world.
- articles published in the journal are placed additionally within the journal in international indexes and libraries.
- is a free access to the electronic archive of the journal, as well as to published articles.
- before publication, the articles pass through a rigorous selection and peer review, in order to preserve the scientific foundation of information.

1000 copies
POLISH JOURNAL OF SCIENCE
Wojciecha Górskiego 9, Warszawa, Poland, 00-033
email: editor@poljs.com
site: http://www.poljs.com

MEDICAL SCIENCES

CHANGES IN THE PANCREAS AGAINST THE BACKGROUND OF EXPERIMENTAL HYPOTHYROIDISM

Niyozov N.,
Assistant of the Department of Human Anatomy and OSTA, Tashkent Medical Academy, Tashkent, Uzbekistan
Akhmedova S.,
DSc, Associate Professor of the Department of Human Anatomy and OSTA, Tashkent Medical Academy, Tashkent, Uzbekistan
Khudoyberganov B.,
Senior teacher of the Department of Human Anatomy and OSTA, Tashkent Medical Academy, Tashkent, Uzbekistan
Sagdullaeva M.,
Senior teacher of the Department of Human Anatomy and OSTA, Tashkent Medical Academy, Tashkent, Uzbekistan
Nisanbayeva A.
Assistant of the Department of Human Anatomy and OSTA, Tashkent Medical Academy, Tashkent, Uzbekistan

Abstract

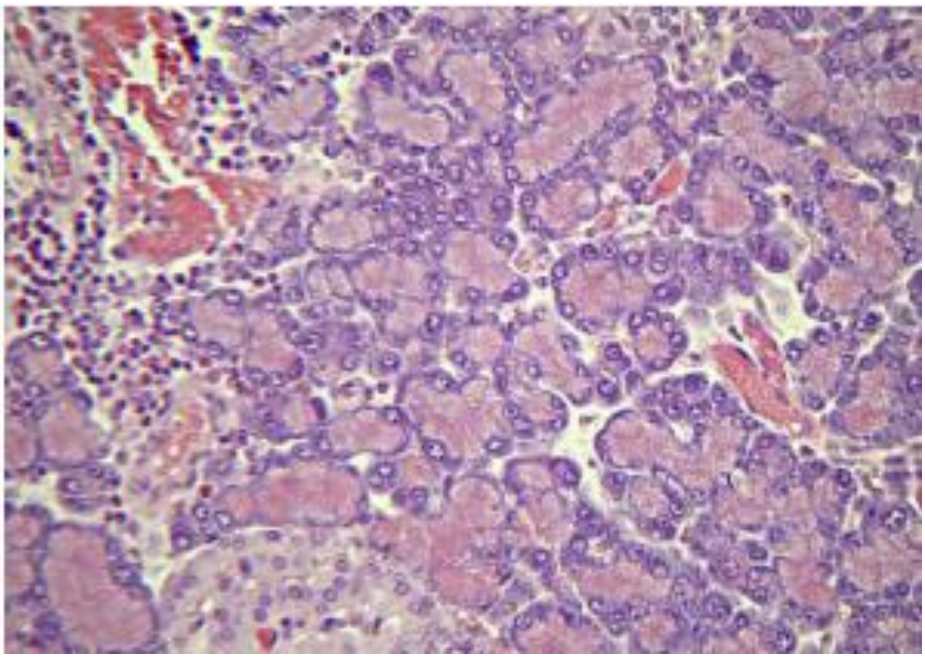
For the study, we used the offspring of rats born from control and experimental white laboratory rats - mothers under conditions of hypothyroidism. The results of the study showed that the introduction of Mercazolil into the pancreatic lobules of experimental rats led to changes associated with the normalization of the structural organization of the pancreatic cranium, interlobular connective tissue with the formation of fibrous tissue components, as well as the disappearance of choroidal edema observed in the interlobular connective tissue.

Keywords: hypothyroidism, mercazolil, pancreas, pancreatic lobes.

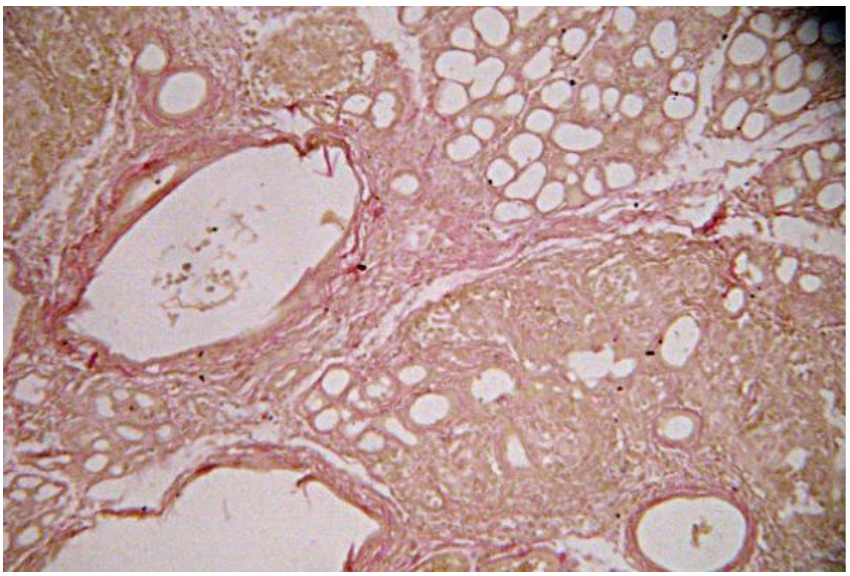
Introduction: Thyroid hormones regulate basal metabolism, consumption of proteins, fats, and carbohydrates, initiate phagocytosis of immunogenic processes, participate in thermoregulatory processes, stimulate the work of hematopoietic organs, increase oxygen consumption by cells and tissues, increase the use of glucose in gluconeogenic processes, promote physical adaptation, regulate adaptive reactions (2,3,4,10). Hypothyroidism is associated with several disorders in all organs and systems due to the various effects of thyroid hormones. First of all, the circulatory system, the digestive system (liver function), the central nervous system, the organs of vision, and the reproductive system are affected (1,7,9,11). They noted that taking thyroid hormones restored pancreatic enlargement (5,6,8,12). The purpose of the research: is to determine the nature of morphological and morphometric changes in the pancreas in experimental hypothyroidism.

Material and methods. To achieve the goal of the study, 56 mature laboratory rats were used. The first group consisted of 20 healthy mature rats. Rats in the control group were given 1.0 ml of distilled water and 1.0 ml of 1% starch suspension every morning to reduce the harmful effects of the oral tube on the stomachs of rats. The second group consisted of experimental laboratory rats, which were given Mercazolil at a dose of 0.5 mg per 100 g of body weight for 14 days to induce experimental hypothyroidism. Then the rats were given Mercazolil at a dose of 0.25 mg per 100 g of body weight for 1 month. A subcutaneous catheter was used as a probe. After the end of the experiment, the rats were slaughtered and the pancreas was taken, paraffin blocks were prepared, and histological preparations were made from them. Experiments and slaughter of animals were carried out in accordance with the "European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes" (Strasbourg, 1985). At a thickness of 8–10 μm, histological sections prepared on a rotary microtome were stained with hematoxylin-eosin in the standard way [Volkova O.V. V., Yeletsky Yu. K., 1982].

Results. The pancreas of control white rats is covered with a capsule on the outside. The capsule consists of dense connective tissue fibers, and connective tissue strands depart from the capsule inward to the parenchyma of the organ, with the help of which the parenchyma of the organ is divided into lobules of different sizes. The connective tissue strands dividing the pancreas into lobes had a weakly expressed fibrous component, and were thinned and edematous in places, as a result of which the lobulation in such areas was poorly expressed. In these layers of connective tissue, blood vessels, nerve fibers, and excretory ducts can be seen. The blood vessels were characterized by plasma impregnation of the walls, and the lumen of the venous vessels was filled with blood cells, in some vessels, the plethora was pronounced (Fig. 1). In some rats, on sections of the gland in arteries and veins passing in the interlobular connective tissue, blood cells were not detected, or were observed in small quantities. The interlobular excretory duct was formed by a single layer of prismatic epithelium and its own plate of connective tissue. In the lumen of the excretory duct, the secreted substance was contained in a small amount.



Rice. 1. Rat pancreas on the 10th day of the experiment. Stasis of blood cells in the vessels and accumulation of leukocytes in the parenchyma of the gland. Hematoxylin-eosin staining.



Rice. 2.
Rat pancreas on the 16th day of the experiment. Expansion of the pancreatic ducts. Stained by Van Gieson.

The control rats were characterized by the presence of mainly medium-sized lobules, in which the exocrine part in the form of acini and ducts of different diameters predominated. The acini had different sizes from 56.2±1.9 μm, the smallest size of the acini was 37.3±1.4 μm. Pancreatocytes in the apical part have narrowings, and the base is much wider. The apical part and the final part of the secretory tubules can be seen as granules of the secret. In these cells, you can see a round or oval nucleus. These pacreocyte nuclei are located closer to the base of the cell. The main part of the chromatin of the nucleus of pancreatocytes is located over the entire area, and a small part of the chromatin is adjacent to the karyolemma. Pancreatocytes, which are located in the walls of the acini, had an average size of 9.17 ± 0.52. In the center of not many acini, flat cells can be seen, they were mostly located closer to the center of the cell, but in rare cases, they were detected in the secretory section.

It was difficult to determine the boundaries between some cells of the pancreas and acini, in some areas it was possible to detect a violation of the structure in the final part of the secretory sections (Fig. 2). These pancreatic cells had an average height of 12.9±1.1 μm. Small punctate hemorrhages were found inside the pancreatic parenchyma and pancreatic islet cells. Between the terminal secretory sections of the exocrine part of the lobules, along with smaller intercalary excretory ducts, the wall of which was lined with squamous epithelium, there were also larger interacinous and intralobular excretory ducts, the wall of which was formed by cuboidal epithelium. The study of pancreatic tissue samples from experimental rat groups showed that the

interlobular connective tissue had a clearer fibrous pattern, the lobules were slightly enlarged and there was no accumulation of fat cells, which indicates the normalization of the structure of the gland.

Conclusion. The results of the study showed that the introduction of Mercazolil into the pancreatic lobules of experimental rats led to changes associated with the normalization of the structural organization of the pancreatic cranium, interlobular connective tissue with the formation of fibrous tissue components, as well as the disappearance of choroidal edema observed in the interlobular connective tissue. In addition, the intensity of symptoms of the destruction of the terminal secretory section of the lobules decreased and at the same time, the number and height of the pancreas in the lobules increased. This may be due to the intensification of the process of division of the pancreas and the activation of the secretory process. In the endocrine part of the gland lobules, a thickening of the location of insulocytes in the islets and a decrease in areas filled with a loose connective tissue layer were observed, in addition, the size of the islets increased and became larger than in the control animals. This may indicate a general increase in the number of endocrine cells in the gland, and hence an increase in hormone production.

References

1. Akhmedova S. M. Morphological characteristics of the development of the walls of the heart of rats // Science and the world. – 2015. – no. 1-2. - S. 85-87.

2. Karimov Kh., Akhmedova S., Ten S. Morphological characteristics of the development of the walls of the heart and their changes under the influence of pesticides //Journal Bulletin of the Doctor. - 2011. - T. 1. - No. 03. - S. 51-54.

3. Cattail, William M. Pathophysiology of the endocrine system / William M. Cattail, A. Archy Ronald; per. from English. - M., 2009. - 336 p.

4. Kurbanovich N. N. et al. Features of Morphological Changes in the Pancreas // Texas Journal of Medical Science. - 2023. - T. 16. - S. 79-83.

5. Mirsharopov U. M., Akhmedova S. M. Influence of the hypothyrous state of the mother on the development of the organs and systems of the fetus // E Conference Zone. - 2022. - S. 25-28.

6. Mirsharopov U. M., Akhmedova S. M. Influence of maternal hypothyroidism on the development of fetal organs and systems // Conference Zone. - 2022. - S. 25-28.

7. Mukhamadovna A. S. et al. Indicators of Fetometry of the Fetus in Pregnant Women in a State of Hypothyroidism // Texas Journal of Medical Science. - 2023. - T. 16. - S. 75-78.

8. Nadolnik, L. I. Features of the antioxidant status of the thyroid gland / L. I. Nadolnik, O. I. Valentyukevich // Byul. experimental biology and medicine. - 2007. - No. 10. - S. 410-412.

9.Рахимова М. О. и др. Фетометрические показатели плодов у беременных в состоянии гипотиреоза //Оргкомитет конференции. – 2021. – С. 143.

10.Niyazov N. K., Nabidjanova D., Valiyeva M. Indications of morphological changes of the pancreas in experimental hypothyroisis //international scientific conference" Innovative trends in science, practice and education". – 2022. – Т. 1. – №. 4. – С. 16-19.

11.Муминов О. Б., Ниёзов Н. К., Нисанбаева А. У. Научный медицинский вестник югры //научный медицинский вестник югры Учредители: Ханты-Мансийская государственная медицинская академия. – 2021. – Т. 1. – С. 141-143.

12.Сагатов Т. А. и др. Морфологическое состояние микроциркуляторного русла и тканевых структур матки при хронической интоксикации пестицидом" Вигор" //Проблемы науки. – 2019. – №. 2 (38). – С. 56-60.