LABORATORY INDICATIONS OF XENOBIOTIC INFLUENCES

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Abstract. The anal canal of the rat rectum is morphologically subdivided into the pre-sphincter region, the transition zone, the internal sphincter, the external sphincter, the space between the sphincters and the intersphincter zone.

When examining the internal and external sphincters of the rectum, it was revealed that they form a complex combined formation. Changes in the wall of the anal canal of the rectum depend on the type and duration of exposure to the xenobiotic and the age of the animals. Xenobiotics affect both their formation and function. The results obtained further reveal the mechanism of occurrence of various disorders of the sphincter apparatus of the rectum in areas with a high content of xenobiotics, in particular copper sulfate and potassium rhodanide.

Key words: Xenobiotics, anal canal, rectum, internal sphincter, external sphincter, space between sphincters and intersphincter zone, copper sulfate and potassium rhodanide.

Annotation. As a result of human economic activity, a large number of different xenobiotics, alien to humans and animals, circulate in the biosphere, many of which have exceptionally high toxicity [1,3]. Xenobiotics are compounds that are foreign to organisms (*industrial pollutants, pesticides, household chemicals, and medicines*). Once released into the environment in significant quantities, xenobiotics can affect the genetic apparatus of organisms, cause their death, and disrupt the balance of natural processes in the biosphere.

Problems are faced by the population living in conditions of ecological instability - contamination of soil, water, atmospheric air and food with xenobiotics. These factors lead to various diseases of internal organs and cause morphofunctional changes in them [2,4].

Before excretion, fecal matter and toxic substances accumulate in the rectum and are absorbed into the human and animal bodies [6,7]. As a result, this part of the digestive tract is affected up to 70% of cases. Many chemicals have carcinogenic and mutagenic properties. Among them, 200 items are particularly dangerous: benzene, asbestos, pesticides, including copper sulfate and potassium rhodonite. Most of them are industrial waste and can enter their wastewater [3,5]. The results of the conducted studies showed that in the wastewater of industrial enterprises in Navoi, an increased content of metal salts was detected and the impact of industrial wastewater on the

internal organs of humans and animals was poorly studied.

Materials and methods. Material for the study included 136 preparations of the anal canal, together with the anus from the rats of the control group of the newborn, 6, 11, 16 and 22 days, 3 months, 6 months 12 months and 24 months. age, and the experimental group at cuswith 6 months old. 12 months and 24 months. age. All animals were kept in the same vivarium conditions. The first experimental group of rats from 1 to 6, from 1 to 12 and from 1 to 24 months of age was watered with water containing copper sulfate at a dose of 5 MPC *(maximum permissible concentration)* – 5.0 mg/l. Another group of rats aged 1 to 6, 1 to 12, and 1 to 24 months were given water containing potassium rhodanide at a dose of 5 MPC – 0.5 mg/l.

The aim of the study was to study the development and formation of structural components of the rectal wall of rats at various stages of postnatal ontogenesis and their changes under the influence of xenobiotics (*copper sulfate and potassium rhodanide)*.

Results and discussion. The rectum of rats is morphologically divided into the pre-sphincter section, the transition zone, the internal sphincter and the external sphincter, the intersphincter zone, and the space between the sphincters in accordance with the structural features of the anal canal. At the border between the pre-sphincter and transition zones, fibrous structures of connective tissue in the inner circular muscle layer begin to envelop bundles of myocytes. The external sphincter covers the internal sphincter distally and externally. The intersphincter zone is bounded by the distal ends of the inner and outer sphincters. In the space between the sphincters, the longitudinal muscle layer and the muscle that raises the anus are divided into bundles that are directed to the internal and external sphincter, connecting them into a single complex combined functional formation.

In the pre-sphincter region, the growth rate of height and width of single-layer cylindrical epithelium cells in the pre-sphincter zone is 13.0% by 22 days of age. In rat pups of 6 months of age, it varies in the range of up to 10.0%. As a result of the action of copper sulfate, the height of the mucous membrane in the pre-sphincter zone decreases by 17.0% for 6 months. During the same period, the effect of potassium rhodanide reduces the height of the mucous membrane in the pre-sphincter zone by 12.0% compared to the control group.

In our opinion, this is due to the compaction of the membranes of the organ wall in response to xenobiotic exposure. This is facilitated by the progressive spiral-like movement of feces along the rectum. By 6 months, as a result of the action of copper sulfate, the height of the mucous membrane decreases during the transition zone by 14.0% compared to the control group. By 24 months of age, under the action of potassium rhodanide, the height of the mucous membrane in the transition zone becomes less by 16.0%.

By day 6 in the muscle membrane of the pre-sphincter zone, the increase in the diameter of the lumen in the capillaries was 20.0%, and in the arterioles-18.0%. From 6 months in the pre-sphincter area, the arterioles of the submucosal base and the venules of the muscular membrane showed an increase in the diameter of the lumen by 16.0%. By 6 months, the effect of potassium rhodanide in the muscle membrane of the pre - sphincter and transition zones increases the diameter of the lumen in capillaries by 25.0%, venules-37.0%, and arterioles-28.0% compared to the control group.

In the proximal part of the transition zone, bundles of myocytes from the outer longitudinal layer join the inner circular layer. In the distal part of this zone, bundles of myocytes of the muscles that raise the anus are adjacent to the outer longitudinal layer, then they are directed together into the space between the sphincters.

In the internal sphincter, the formation of structural components occurs differently depending on age. During breastfeeding, compared with the mucous membrane and submucosal base, an increase in its muscle membrane is expressed. Subsequently, the growth of the muscle membrane of the internal sphincter continues to prevail, by 6 months it is larger in its proximal part.

On the 6th day of development, an increase in the thickness of the internal sphincter is revealed in comparison with the length - 50.0% in the anterior part. By the 6th month, the growth rate of the internal sphincter thickness in its anterior part is also expressed-61.0%.

By 6 months, the effect of copper sulfate reduces the thickness of the internal sphincter in the anterior part by 23.0% compared to the control group. By 12 months of age, under the action of potassium rhodanide, the thickness of the internal sphincter becomes 27.0% less in the same area compared to the control group.

In our opinion, the beginning of coverage of myocyte bundles by fibrous connective tissue structures in the internal sphincter is its proximal border. Closer to the anal opening, these fibrous connective tissue structures become larger and clearly delineate from the surrounding tissue.

By day 6, the increase in the diameter of myocyte bundles of internalero sphinctera was 51.0%, and in them the increase in the density of the location of myocyte nuclei was 46.0%. In 3-month-old rats, the increase in the density of the location of myocyte nuclei in the internal sphincter is 6.0%.

At 6 months, the effect of copper sulfate reduces the diameter of myocyte bundles of the internal sphincter by 41.0%. During this period, under the action of potassium rhodanide, the diameter of myocyte bundles of the internal sphincter is 53.0% smaller than in the control group. The internal sphincter, like a narrow cylinder, consists of bundles of circular myocytes. They have different shapes and locations depending on the site. In the proximal part, the layers consist of bundles of myocytes of a rounded shape, and they lie transversely with respect to the longitudinal axis of the channel. In

the area of its coverage by the external sphincter (*distal part)*, the layers consist of bundles of circularly directed myocytes with an elongated oval shape.

In this section, the layers are arranged obliquely in a spiral, relative to the longitudinal axis of the anal canal. In the process of development, the muscle membrane of the external sphincter is formed differently. During lactation, the increase in the thickness of the outer sphincter muscle membrane is more pronounced in the distal part. By 12 months, the outer sphincter muscle membrane becomes thicker in the proximal part.

Exposure to xenobiotics affects the formation of rat rectal sphincters, the degree of severity of these changes depends on age and their type. By the age of 6 months, the structure of the internal sphincter changes more with the action of copper sulfate. At the 12th month, when exposed to potassium rhodanide, more pronounced morphological changes occur than when exposed to copper sulfate. By 12 months of age, the effect of potassium rhodanide showed a greater reduction in the thickness of the external sphincter by 58.0% in the anterior part compared to the control group. The process of sphincter formation under the action of potassium rhodanide is delayed compared to the control group.

In the process of development, morphometric indicators of the relative position of the rectal sphincters change. The difference in length between the external and internal sphincter is reduced by up to 1.6 times and the proportion of coverage of the internal sphincter by the external sphincter increases.

The muscle membrane of the external sphincter consists of two rows of longitudinally arranged bundles of circular myocytes of rounded shape. They lie obliquely, and their angle of deviation from the longitudinal axis of the anal canal is greater than in the internal sphincter. On day 11, the growth rate of the external sphincter thickness was 54.0% in the posterior part. In 12-month-old rats, the increase in the thickness of the external sphincter increases by 55.0% in the anterior part. In the sphincters of the rectum, by day 6, the rate of increase in the diameter of the lumen in venules and arterioles is 16.0%. By 6 months of age, under the action of sulfate, the diameter of the lumen in the venules is 30.0% larger in the sphincters of the rectum, compared with the control group. By the 6th month of the experiment, under the action of potassium rhodanide, the diameter of the lumen in the venules increases by 34.0% compared to the control group.

In experimental groups, as a result of the action of xenobiotics, the density of connective tissue bundles in the structures of the anal canal wall increases, as a result of which the density of myocyte nuclei in the rectal sphincters increases, which can lead to a violation of their contractility.

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In experimental groups, as a result of the action of xenobiotics, the density of connective tissue bundles in the structures of the anal canal wall increases, as a result of which the density of myocyte nuclei in the rectal sphincters increases, which can lead to a violation of their contractility. The process of formation of the muscle membrane of the rat rectal sphincters is delayed, this is expressed when exposed to potassium rhodanide. Differences in the structure of epithelium and fibrous structures of connective tissue were revealed in the intersphincter zone. This is due to the fact that it is located on the border between the anal canal and the external environment.

In the space between the sphincters, the longitudinal muscle layer and the muscle that raises the anus together with the fibrous structures of connective tissue are directed to the internal and external sphincters of the rectum, intertwining with them, form a complex morphofunctional formation. By day 16, the growth rate of the longitudinal muscle layer thickness is 28.0%. For the 3rd month, it is 10.0%. Between the

sphincters, the bundles of myocytes of the longitudinal muscle layer and the muscle that raises the anus diverge in different directions; the medial part passes into the internal sphincter, the lateral part goes to the external sphincter, the middle part of the bundles of myocytes leaves the space, and intertwines with the fibrous structures of connective tissue between the sphincters.

In our opinion, these bundles of myocytes connect the sphincter into a complete anatomical formation, thereby possibly ensuring the synchronization of the internal and external sphincters. At 12 months, the effect of copper sulfate revealed a decrease in the thickness of the longitudinal muscle layer in the space between the sphincters by 40.0% compared to the control group. By 24 months of age, under the action of potassium rhodanide, the thickness of the longitudinal muscle layer is 42.0% less than in the control group.

In the anal canal of the rat rectum, exposure to copper sulfate and potassium rhodanide leads to their accumulation in the rat body. The content of residual amounts of copper and rhodanide prevails in the esophagus and rectum. However, it should be noted that in the sphincter zones of the digestive tract, more residual amounts of copper are detected, so in the gastroduodenal junction by 3.5 times and in the sphincters of the rectum by 2.0 times it is higher compared to the content of rhodonite amounts.

Thus, it is established that the anal canal is divided into the pre-sphincter section, the transition zone, the internal sphincter, the external sphincter, the space between the sphincters and the intersphincter zone. When examining the internal and external sphincters of the rectum, it was revealed that they form a complex combined formation. Changes in the wall of the anal canal of the rectum depend on the type of xenobiotic, the duration of its exposure, and the age of the animals. Xenobiotics affect both their formation and function. The results obtained further reveal the mechanism of occurrence of various disorders of the sphincter apparatus of the rectum in areas with a high content of xenobiotics, in particular copper sulfate and potassium rhodanide.

References

1. Buzoleva L. S., Krivosheeva A.M., Influence of heavy metals on the reproduction of pathogenic bacteria. Advances in modern natural science. 2013. No. 7. 30-33 p.

2. Khikmatovna, Hamidova Saodat. "Immunological Reactivity, Lipid Peroxidation and Antioxidant Activity under Stress (Literary Review)." *international journal of health systems and medical sciences* 1.4 (2022): 13-18.

3. Inoyatov F. Sh. Individual characteristics development of adaptive processes of the body under the influence of various xenobiotics: Abstract of the dissertation of the Doctor of medical sciences. - Tashkent, 2003, -19 p. p. 39-51.

4. Buriev S. et al. Development of biotechnological bases for treatment of polluted waters with aquatic plants and their use in agriculture //Collection of materials of the international scientific and practical conference "Problems of ecology in agriculture". Bukhara, 2003, pp. 418-419.

5. Suvorova G. N., Borisov A. P. Reactive changes in the rectal wall under conditions of experimental obstruction //Modeling in medical and biological research: Collection of scientific works, Samara, 1999, pp. 164-165.

6. Suleymanov, S. F. "The use of immunocorrective and eradication therapy in patients with duodenal ulcer." Journal of Theoretical and Clinical Medicine 4 (2018): 117-118.

7. Suleymanov, S. F., and N. U. Narzullaev. "Characteristics of ENT organs in HIV–infected children: monograph." (2017).

8. Сулейманов, С. Ф. "Инновационные методы управления в системе высшего образования." Актуальные вопросы со вершенствования менеджмента: материалы научно практической конференции. 2016.

9. Nasullaevna, H. N., &Vohidovna, O. D. (2021). The efficiency of glossalgia and stomatalgia complex treatmenT. Биологияиинтегративнаямедицина, (6 (53)), 374-379.

10. Khabibova N. N. Evaluation of vascular tissue disorders and regional bleeding under chronic reduced preparative atphosis //Proceedings of The ICECRS. – 2019. – Т. 4.

11. Khabibova N. N. Local humoral factors of the immune protection in patients with cras //International Scientific Review. – 2019. – №. 1. – С. 39-41.

12. Khabibova N. N. Studying of biochemical and cytokine markers of inflammation in the oral liquid and blood in patients with cras //european research: innovation in science, education and technology. – 2019. – С. 39-41.

13. Khikmatovna H. S. Drinking water quality source of life //Web of Scientist: International Scientific Research Journal. – 2021. – Т. 2. – №. 10. – С. 35-40.

14. Khikmatovna H. S. Immune Reactions in the Body Based on Listeriosis //Eurasian Medical Research Periodical. – 2022. – Т. 7. – С. 56-61.