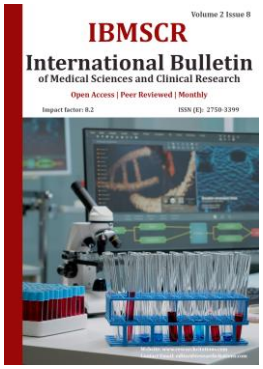

GISTOMORPHOMETRIC FEATURES OF THE DECA WALL IN LABORATORY WHITE RATS IN EARLY POSTNATAL ONTOGENESIS

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Annotation. The article discusses the features of the structure of the walls and mucous membrane of the caecum in the area of sphincters in white laboratory rats in the dynamics of development in early postnatal ontogenesis. And also about the relevance of studying the histomorphometric features of the structure of the cecum wall in white laboratory rats in early postnatal ontogenesis and the need to take into account the results obtained during resection of the colon in children.

Keywords. White laboratory rats, resection, mucous membrane, caecum, epithelium.

Relevance. Despite the achievements of modern medicine in the field of pediatric coloproctology, there is a need to study the histomorphological features of the colon, the development and implementation of the most effective, sparing methods of surgical treatment in the treatment of pathologies of the gastrointestinal tract [3,6,15,18,21].

The study of scientific literature devoted to the diagnosis and treatment of pathologies of the gastrointestinal tract, the choice of surgical methods of treatment, based on the form of pathology of the colon and on the morphological features of the structure of the walls, is insufficiently covered. intestines in children [2,4,7,10,14]. To prevent postoperative complications, it is necessary to study their mechanisms of occurrence and structural features of the colon in children [2,4,7,10,16,17,20]. The above proves and determines the need for additional scientific research to study the parameters of the large intestine in experimental animals, since, due to humanitarian considerations, experiments on the human body are limited, there is a need to use white laboratory rats as an alternative. the results of which will be taken into account in the surgical correction of colon pathologies in children. [2,4,7,10,14,15,18]. To study the mechanisms of occurrence of complications and their prevention, there is a need to study the structural features of the colon in children [2,4,7,10,21]. Due to a number of qualities: fast metabolism, unpretentiousness, non-aggression, outbred white laboratory rats are one of the main experimental animals in biological and medical research. A small body weight, resistance to infectious diseases, relatively simple maintenance and successful breeding in the laboratory make it possible to simultaneously involve a significant number of these animals in experiments [1,5,8,11,16,18].

Target. Study of the features of the histomorphometric structure of the cecum wall in white laboratory rats in the dynamics of the early period of postnatal ontogenesis.

Materials and methods. For the experimental study, 58 outbred white laboratory rats in the early period of postnatal ontogenesis were used and divided into 4 subgroups depending on age.

the 1st group included 14 heads of 1-day-old white laboratory rats;
the 2nd group included 16 heads of 7-day-old white laboratory rats;
the 3rd group included 14 heads of 14-day-old white laboratory rats;

The 4th group consisted of 14 heads of 21-day-old white laboratory rats. All experimental animals underwent an autopsy of the abdominal cavity, followed by a study of the abdominal organs. The material for histomorphometric study was fresh samples of the colon of white laboratory rats, in the early postnatal period of life - on the 1st, 7th, 14th and 21st days of life.

The discussion of the results. In early postnatal ontogenesis, the total thickness of the wall of the caecum in the area of the sphincter in newborn rat pups averages 89.9±14.08 μm. By the 7th day of life of white rats, the wall thickness of the caecum in the area of the sphincter is on average 146.1±17.89 μm. On the 14th day of development, the wall thickness of white rats in the sphincter area averaged 163.3 ± 21.37 μm, and by the 21st day of life of white rats, the wall thickness of white rats in the sphincter area averaged 225.4 ± 21.57 microns, which significantly differs from the indicators of the previous groups (p≤0.005). (Table 1).

Table 1.

Age-related morphological features of the mucous membrane of the caecum of rats in early postnatal ontogenesis

age (days)	Qty (n)	Thickness submucosal basics Uv.(7x25)	Crypt Height SW. (7x10)	Mucous shell Increase (7x10) 16.8	Height epithelial layer Uv.(7x65) 2.4 x	Total thickness walls
1	14	10.2±3.97	20.4±10.64	52.8±10.64	2.9±1.02	89.9±14.08
7	15	16±2.98	50.4±16.56	94.1±15.38	7.4±1.48	146.1±17.89
14	16	19.5±4.11	129.9±15.38	105.3±16.64	8.2±1.78	163.3±21.37
21	16	24.3±8.07	132.2±46.17	153.4±13.72	10.6±2.64	225.4±21.57

The mucous membrane of the caecum of white laboratory rats in the area of the sphincter is lined with an integumentary single-layer cylindrical, columnar epithelium, which consists of epithelial cells, between which there are goblet cells in places and, in places, single Paneth cells are found closer to the base of the villi.

The height of the mucous membrane in early postnatal ontogenesis in newborn white rat pups in the area of the sphincter is on average 52.8±10.64 μm. On the 7th day of early postnatal life ontogenesis of white rats, the height of the mucous membrane was 94.1±15.38 μm. By the 14th day of development of white rats of white rats, the height of the mucous membrane averaged 105.3 ± 16.64 μm, by the 21st day of life of early postnatal development of white rats, the height of the mucous membrane in the sphincter area averaged 153.4 ± 13 .72 μm, which significantly differs from the indicators of the previous groups (p≤0.005).

In newborn rat pups, the height of the epithelial layer of the caecum in the area of the sphincter averages 2.9±1.02 μm. On the 7th day of life, the height of this layer in rats in the sphincter area averaged 7.4±1.48 μm. By the 14th day of life of white rats, the height of the epithelial layer in the area of the sphincter is on average 8.2±1.78 μm. On the 21st day of life in rats, the height of the epithelial layer in the area of the sphincter is on average 10.6±2.64 μm, which significantly differs from the values of the previous groups (p≤0.005).

The height of the crypts of the mucous membrane of the caecum in newborn rat pups in the sphincter area averaged 20.4±10.64 μm. On the 7th day of life of whites, the height of the crypts of the cecum in the area of the sphincter is 50.4±16.56 μm on average. By the 14th day of life of white rats, the height of the crypts of the caecum in the area of the sphincter is on average 129.9±15.38 μm. In 21 day old rats, the height of the mucous membrane of the caecum in the sphincter area averaged 132.2±46.17 μm, the reliability of this indicator is (p≤0.001).

All morphofunctional elements of the mucous membrane in the area of the sphincter are located on the own plate of the mucous membrane, consisting of fine-fibred tissue, which serves as the boundary between the mucous membrane and the submucosa. The proper plate, located between the mucosa and submucosa, repeats the weight of the relief of the mucosa and participates in the formation of depressions and protrusions, serve as the basis of crypts, attaching depressions to the submucosa.

In newborn rat pups, the thickness of the submucosa of the caecum in the area of the sphincter is 10.2 ± 3.97 μm on average. By the 7th day of life, early postnatal development of white rats, the thickness of the submucosa of the caecum in the area of the sphincter is on average 16±2.98 μm. On the 14th day of life of white rats, the thickness of the submucosa of the caecum in the sphincter area averaged 19.5±4.11 μm, and by the 21st day of life of early postnatal development, the thickness of the submucosa of the caecum averaged 24.3±8, 07 μm. The reliability of this indicator is (p≤0.001).

The muscular coat of the caecum of white rats consists of two mutually perpendicularly directed smooth muscle fibers. The inner - circular layer consists of several mutually parallel groups of smooth muscle fibers, with a slight slope. These groups of circular fibers are wrapped in a sheath consisting of loose-fibrous, elastic fibers, forming a sheath.

In early postnatal ontogenesis in newborn rat pups, the thickness of the inner circular muscular layer of the cecum in the area of the sphincter averages 12.5±2.36 μm. On the 7th day of life of white rat pups, the thickness of the inner circular muscle layer of the caecum in the area of the sphincter is on average 14.9±2.98 μm. By the 14th day of life of white rats, the thickness of the inner circular muscle layer of the caecum in the area of the sphincter averaged 17.3±5.38 μm. On the 21st day of life of white laboratory rats, the thickness of the inner circular muscle layer of the caecum in the sphincter area averaged 23.8±5.42 μm. The reliability of this indicator is (p≤0.005). The longitudinal layer of the muscular membrane also consists of mutually parallel bundles of smooth muscles, wrapped in a connective tissue case. In some places between the layers there are connective tissue fibers, originating from the adventitia and penetrating the muscular and submucosal layers, reaching its own plate and forming the basis of the intestinal wall retaining apparatus. The longitudinal layer of the muscular membrane of the caecum in white rats is not only the outer part of the muscular membrane, but at the same time is the outer border of the intestinal wall, outside it is covered with a thin layer of visceral peritoneum (Table 2).

Table 2.

Age-related morphological features of the muscular layer of the caecum of rats in early postnatal ontogenesis

age	Qty (n)	The thickness of the muscular outer shell Uv.(7x25)

		Outer longitudinal layer	Interior circular layer	Total thickness
1 day	14	8.4±2.77	12.5±2.36	26.9±4.31
Day 7	15	9.5±2.69	14.9±2.98	36±7.56
Day 14	16	14.3±3.3	17.3±5.38	38.6±7.15
21 day	16	16.5±4.83	23.8±5.42	47.7±9.66

In early postnatal ontogenesis, the thickness of the longitudinal layer of the muscular membrane of the caecum in white newborn rat pups in the area of the sphincter averages 8.4±2.77 μm. By the 7th day of development, the thickness of the longitudinal muscular layer of the caecum in white rats in the sphincter area is on average 9.5±2.69 μm. By the 14th day of life of white rats, the thickness of the longitudinal muscular layer of the caecum in the area of the sphincter averaged 14.3±3.3 μm. By the age of 21 days of white rats, the thickness of the longitudinal muscular layer of the caecum in the area of the sphincter averaged 16.5±4.83 μm. The reliability of this indicator is ($p \leq 0.005$).

In early postnatal ontogenesis in newborn rat pups, the thickness of the muscular layer of the caecum in the area of the sphincter is on average 26.9±4.31 μm. On the 7th day of life of white rat pups, the thickness of the muscular layer of the caecum in the area of the sphincter is on average 36±7.56 μm. By the 14th day of life of white rats, the thickness of the muscular layer of the caecum in the area of the sphincter averaged 38.6±7.15 μm. On the 21st day of life of white laboratory rats, the thickness of the muscular layer of the caecum in the sphincter area averaged 47.7±9.66 μm. The reliability of this indicator is ($p \leq 0.005$).

Conclusion.Thus, all layers of the walls of the caecum in rats in early postnatal ontogenesis in the area of the sphincter grow and develop intensively, the rate of growth and gain is especially clearly visible on the terms of 14 and 21 days of the study. In our opinion, this is due to the transition of white laboratory rats from dairy to mixed nutrition.

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