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Morphological Features of the Ceca in the Area of Sphincters in White Laboratory Rats in Early Postnatal Ontogenesis

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ABSTRACT

This article presents the features of the mucous membrane of the cecum in the area of sphincters in white laboratory rats in the dynamics of development in early postnatal ontogenesis.

Relevance. Despite some success in the treatment of colon pathologies in children, there is a need to develop and introduce into practice the treatment of more effective, sparing methods of surgical treatment [3,6,15]. Among the literature placed in the public domain, the choice of surgical methods of treatment based on the form of the pathology of the large intestine and on the morphological feature of its structure in children is not sufficiently covered. All this proves and determines the need for additional scientific research to study the parameters of the colon in experimental animals, the results of which will be taken into account in the surgical correction of colon pathologies in children. 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 [2,4,7,10,14]. Since, due to humanitarian considerations, experiments on the human body are limited, it becomes necessary to use white laboratory rats as an alternative [6,9,13,17]. 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 characteristics of the mucous membrane of the caecum in the area of sphincters in white laboratory rats in the dynamics of the early postnatal period of ontogenesis.

Materials and methods. For the experimental study, 58 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 microscopic examination 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.

Discussion of results. In early postnatal ontogenesis in newborn rat pups, as is known, the colon is very thin, fragile, and the mucous membranes in all sections have a relatively similar structure. The common basis of the mucous membrane of the large intestine in the region of the sphincters is a thin layer of loose connective tissue, which is called its own plate. From the side of the intestinal cavity, it is covered with an epithelial layer, which, in terms of functional significance, is a barrier between the cavity of the gastrointestinal tract and the internal environment of the body. Between the epithelial layer and its own plate there is a basement membrane, which is the basis of the epithelial layer. Under it there is a muscular plate, which occupies a border position between the basement membrane and the submucosal layer, consisting of loose connective tissue. In the mucosa, covered with a single-layer cylindrical epithelium and glands, in some places there are accumulations of lymphatic tissue. The single-layer integumentary epithelium is represented by a layer of high cylindrical, border and goblet epithelial cells.

In newborn rat pups in the period of early postnatal development, during visual examination, the mucous membrane of the caecum is not expressed, the surface relief of the mucous membrane is smooth, visual protrusions and immersions are not detected during visual examination.

By the 7th day of the early postnatal period of development, the configuration of the relief of the mucous membrane of the caecum of white rats begins to show changes in the form of randomly located, barely noticeable protrusions and slight immersions, the visual picture of the mucous membrane appears to be grainy in the image, no folds are detected.

On the 14th day of life of the early postnatal period of development of white rats, upon visual examination, the configuration of the relief of the mucous membrane becomes more pronounced, slight duplicative folds appear in the area where the terminal part of the small intestine flows into the caecum. In the basal part of the mucous membrane of the caecum, randomly located protrusions and immersions are noticeable, due to which the picture of the mucous membrane appears grainy, rough.

In 21-day-old rats in the early period of postnatal development, the visual configuration of the relief of the mucous membrane becomes more pronounced compared to the previous observation period. Duplicate folds in the area where the terminal part of the small intestine enters the cecum are formed, they act as a functional one-way valve. The mucosa of the basal part of the caecum looks like alternating protrusions and immersions, formed folds are noticeable, acquire the outlines of a circularly oriented orientation with a slight inclination in the cranial direction.

Conclusion. The mucosa of the cranial part by the late period of early postnatal ontogenesis acquires the shape of a longitudinally oriented orientation. These dives penetrate the entire layer of the lamina propria of the mucous membrane, reaching the border of the submucosa. On the outer surface of the mucous membrane of the cecum, the protrusions form a tiny network of folds and protrusions, which present a picture of "shimmering algae of the seabed". In our opinion, the severity of these features of the configuration of the mucous membrane of the caecum of white rats by this period of early postnatal development is associated with the complete transition to feeding these animals on roughage.

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