

UDK: 611.81:616.092.9

MORPHOLOGICAL STATE OF THE STRUCTURAL COMPONENTS OF THE GASTRIC WALL OF EXPERIMENTAL WHITE MICE IN THE DYNAMICS OF POSTNATAL ONTOGENESIS

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Abstract. The results of our research showed that the processes of postnatal development of the gastrointestinal tract organs and the formation of vascular-tissue structures are natural organ-specific, genetically programmed processes that manifest themselves in the formation of special structures of structural components. At the same time, age-related changes in the morphology and architecture of tissues and blood vessels are the structural basis of their adaptive reactions to internal and external environmental conditions.

Key words: white rats, stomach, tissues and blood vessels, postnatal ontogenesis.

Annotatsiya. Tadqiqotlarimiz natijalari shuni ko'rsatdiki, oshqozon-ichak trakti organlarining postnatal rivojlanishi va qon tomir-to'qima tuzilmalarining shakllanishi jarayonlari tabiiy organga xos, irsiy dasturlangan jarayonlar bo'lib, ular struktur komponentlarining maxsus tuzilmalari shakllanishida namoyon bo'ladi. Shuningdek, to'qima va qon tomirlarining morfologiyasi va arxitekturasidagi yoshga bog'liq o'zgarishlar ularning ichki va tashqi muhit sharoitlariga moslashuv reaksiyalarining tarkibiy asosi hisoblanadi.

Kalit so'zlar: oq kalamushlar, me'da, to'qima va qon tomirlar, postnatal ontogenez

Аннотация. Результаты наших исследований показали, что процессы постнатального развития органов желудочно-кишечного тракта и формирования

сосудисто-тканевых структур являются естественными органоспецифическими, генетически запрограммированными процессами, которые проявляются в формировании особых структур структурных компонентов. При этом возрастные изменения морфологии и архитектуры тканей и кровеносных сосудов являются структурной основой их адаптивных реакций на внутренние и внешние условия среды.

Ключевые слова: белые крысы, желудок, ткани и кровеносные сосуды, постнатальный онтогенез.

Relevance of the topic. The study of postnatal morphogenesis of internal organs is of great theoretical and practical importance, since the selection of the volume of surgical intervention in various pathologies of internal organs is an urgent problem of modern surgical practice [2,4,7,8]. Also, age characteristics of the components of internal organs are important for the correct definition and interpretation of the concept of "age norm" in the analysis of morphological criteria of pathological processes. Nevertheless, the age-related morphology of various internal organs is one of the least studied areas of medicine [1,3,5,6].

The purpose of the study. To study and analyze morphological changes in the postnatal ontogenesis of the stomach of intact experimental animal offspring.

Research materials and methods. The object of the study was the offspring of 70 rats born from experimental intact female rats. To achieve the set tasks and goals, general morphological, morphometric and statistical research methods were used.

Results. Studies of stomach micropreparations of intact rat offspring in the early postnatal period (3-7 days) showed that the stomach wall consists of 4 layers: mucous, submucosal, muscular and serous layers.

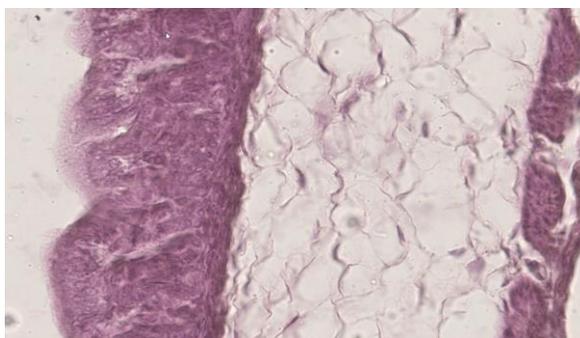


Fig-1. Morphological state of the stomach wall on the 3rd day of postnatal life of offspring born from intact rats. The mucous, submucosal and serous-muscular layers are formed and are clearly visible, the tissue structures are not yet fully formed. G.-E. 20×10.

All layers of the stomach are clearly visible in micropreparations. The mucous layer consists of epithelium, a special connective and muscular plate. The mucous layer has a specific relief due to the presence of folds, crypts and pits. These formations create the most favorable conditions for the processes of digestion and absorption of food and increase the total surface area of the mucous layer. The state of the stomach of rat pups in the early postnatal periods is characterized by the incomplete maturation of its structural and functional components. The stomach of newborn rat pups is histologically clearly divided into 4 areas:

In the first 3-7 days of postnatal life of rat pups, the volume of structural formation processes in all layers of the stomach and intestines also increases. These processes increase the number of cells in all layers, decrease with an increase in the number of mitoses, and an increase in the number of formed blood vessels. All these processes occur at different speeds, so the cytoplasm of some cells initially becomes eosinophilic, and then gradually becomes basophilic over a period of 14 days. From this period, the volume of cytoplasm in the cell increases. At the same time, all links of blood vessels are fully formed, turning into clear blood vessels and capillaries, and mesenchymal elements disappear. By the 30th day of postnatal life, the histological formation processes in the stomach of rat pups are almost complete. However, despite this, it was observed that intensive mitotic processes were maintained in all layers of the stomach even during these periods.

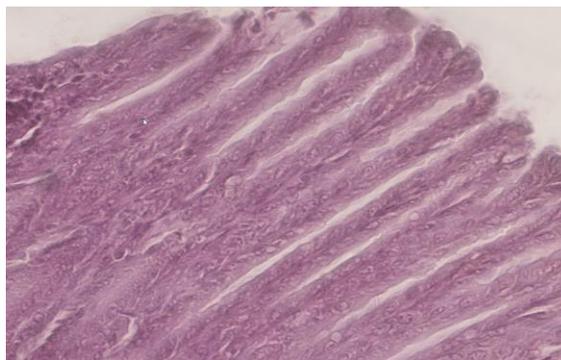


Fig- 2. Histological view of the stomach wall of rat pups on the 30th day of postnatal life. All layers of the stomach wall are clearly distinguished: mucous, primordial plate, submucosal and serous-muscular layers, histologically the formation processes are almost completed. G.-E. 20×10.

The submucosal layer consists of a tangle of nerves and blood vessels and sparse fibrous unformed connective tissue. The muscular layer consists of 2 layers: the inner circular and outer longitudinal layers. The inner muscular layer is well developed compared to the outer muscular layer. The serous layer consists of a single layer of mesothelial cells, the thickness of the layer is approximately the same along the entire length of the intestine. Microscopic studies of the stomach of the rat offspring in the early postnatal ontogenesis showed that all layers of the stomach showed the characteristics of the formation of cells, the gradual accumulation of special ultrastructures in them, the main stages of the processes of formation of gastric tissue structures, and the processes of regulation of the intracellular system. The stomach of the rat offspring was morphologically and morphometrically completed in ultrastructural terms by the 21st day of postnatal ontogenesis. The processes of cell formation were completed at different times with the gradual transition of animals to definitive nutrition, that is, in the period of 21-30 days. Therefore, the morphology and morphometric indicators of the tissue and blood vessels of the stomach during these periods can be considered as close to the stomach of fully formed and functionally mature animals.

Measurements of the weight of the stomachs of rat pups in postnatal ontogenesis showed that their mass increases continuously from the early stages of postnatal ontogenesis. The most rapid periods of stomach growth correspond to the period up to the first 30 days. In the later stages of postnatal ontogenesis, these processes slow down.

Analysis of the blood supply of the stomach wall showed that the blood supply to the stomach is provided by straight arteries originating from the main arterial arch. Straight arteries give off arterioles in the serous layer of the stomach, enter the muscular layer, and then the submucosa, where they form a vascular network. The arteries are dichotomously divided into I-VI order branches. IV-VI order blood vessels are considered microvessels. Microcirculation includes arterioles, capillaries, postcapillary venules and venules. The submucosa of the stomach is penetrated by all types of internal arteries. In the folds and pits of the stomach, capillaries form a network. They anastomose with each other, forming cells of the capillary network. At the bottom of the pits or in a part of their lower end, postcapillary venules are collected. Postcapillary venules have a larger caliber than capillaries.

**Morphometric parameters of microvascular blood vessels in the gastric wall
 mucosa of intact rats (30 days old), M±m**

Indicators	M±m
Diameter of the inner lumen of arterioles, μm	26,2±0,31
Diameter of the lumen of capillaries, μm	7,2±0,23
Diameter of the lumen of postcapillaries, μm	13,1±0,20
Diameter of the lumen of venule, μm	25,0±0,15
Density of distribution of vessel of the mucous membrane, (in conventional units)	395,5±6,1

Conclusion. The processes of postnatal development of the organs of the gastrointestinal tract and the formation of vascular-tissue structures are natural organ-specific, genetically programmed processes, which are manifested in the formation of special structures of the system of structural components. Also, age-related changes in the morphology and architecture of blood vessels are the structural basis of their adaptive reactions to internal and external environmental conditions.

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