IMMUNOHISTOCHEMICAL AND MORPHOLOGICAL SIGNS OF OVARIAN FORMATION IN THE EARLY POSTNATAL PERIOD

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Abstract*. This article aims to determine the specific morphological and immunohistochemical signs of the formation of a child's ovary in the embryonic and early postpartum period in girls. Morphologically and histochemically, the ovaries of 22 infants who died from asphyxia up to 3 months were studied. The results of the study showed that in the reproductive period, the development of ovarian dysfunction caused by pathologies in embryonic ontogenesis was detected. It was confirmed that the pathologies of the embryonic period affected the development of the ovary as a dangerous factor, leading to the development of hypoxia, dishormonal interaction, dystrophy and damage to ovarian tissue, the development of the main morphofunctional structures of the ovary, can be destroyed, necrosized in the fetal period, develop reparative inflammation or lead to hyperplasia.*

Keywords*: infant, early postnatal period, ovary, ontogenesis, morphology, histochemistry of ovaries, primordial egg, reproductive, endocrine.*

The aim of the work is to determine the specific morphological and immunohistochemical signs of ovarian formation in girls in the early postnatal period.

Materials and methods of research. The ovaries of 22 children who died of asphyxia and pneumopathy before 3 months as a result of aspiration from the umbilical cord and tight cord entanglement were taken as material for the study.

In the reproductive period, ovarian dysfunction may develop due to pathologies in embryonic ontogenesis. Pathologies in the embryonic period can affect the development of the ovaries as dangerous factors, hypoxia, dishormonal phenomena, dystrophy and damage to ovarian tissue can develop, delay the development of the main morphofunctional structures of the ovary, cause destruction, necrosis, the development of reparative inflammation or hyperplasia in the fetal period.

The relevance of the problem. Ovarian pathologies occupy an important place in the structure of gynecological diseases [3,4,7,8,9]. The frequency of marriage in infertility is 10-15%, if it is due to endocrine pathology, it increases to 35-40%. Violation of folliculogenesis in the ovary plays a key role in the development of infertility. According to the scientific literature, the level of egg development is directly related to the morphofunctional completion of folliculogenesis [1,2,4,8,9].

The ovary is one of the organs with the most complex structure in the human body. This is due to the fact that three embryonic tissues are involved in the formation and differentiation of the ovary: endoderm, mesoderm and ectoderm. The complexity of the structure of the ovary lies in the fact that it goes through all the stages of undifferentiated glands in its development [3,5,6,8,9,10]. Follicles are an important structural unit of the ovary, they produce the corpus luteum, atretic corpuscles, perform reproductive and endocrine functions of the body in the postembryonic period.

Currently, as established by a number of scientists, the connection of ovarian pathology has been confirmed: polycystic ovarian insufficiency syndrome and other reproductive disorders with the development of the genital glands of girls in the perinatal period.

The results of the study and their discussion. The results of the morphological study showed that the outer surface of the child's ovary was covered with a single-layered epithelium, flattened in places, but mostly cubic in shape. A basement membrane was found under the epithelium, the surface layer of which is composed of thin fibers, and the lower one is an unformed connective tissue. Fibrous bundles of various sizes penetrate from the unformed connective tissue layer of the basement membrane into the cortical layer of the ovary. When scanning and topographical examination of the histological section prepared from the ovary, it is determined that the cortical layer occupies a relatively large area and contains a large number of primordial follicles. Histologically different histotopographic structures were revealed in the ovaries studied by us. In one case, the cortical layer occupies a large area, and in another it is relatively thin and takes up less space, in another case the boundary between the cortical and cerebral layers is fuzzy, in the fourth case the cortical layer is wide in one place and narrow in another, and in the fifth case the primordial follicles are few and unevenly located in the cortical layer. areas that are both sparse and chaotic in other areas. It has been confirmed that the histotopographic structure of the ovarian tissue of newborn children does not resemble each other, as shown above, that is, they have different histotopographic structure, form at different levels during the embryonic period and differentiate in different periods. levels.

Histological examination of the ovaries of newborns reveals that the cortical layer is complete and the marginal parts of the medulla are located in a diffuse state consisting of rudimentary primary eggs of almost the same size. At the same time, it is observed that the outer shell of the ovary consists of connective tissue fibers with a relatively thin, eosinophilic structure. Swollen and inflamed granulosa and celemic cells are found under the outer shell.

Structures consisting of primordial oocytes and follicles in the cortical layer thin out and relatively increase in size as they approach the medulla. There is a difference in the structure of the stroma tissue and the cells located between them. If it is observed that both connective tissue cells and fibers are relatively few and sparsely located among the primitive follicles in the cortical layer, in the inner region of the cortical layer and in the interstitial of the medulla, connective tissue cells are found to be numerous and hyperchromic in color. Among the primorphic follicles in the cortical layer, atresia is located, and their components are stained with hematoxylin in a dark blue color, that is, calcification has developed.

When examining primary eggs and follicles in the ovarian cortex under a microscope, the following results are obtained. In some primordial structures, an egg cell with a large nucleus and a relatively hyperchromic cytoplasm surrounded by a single-layered granulosa cell was found. In most primordial structures, a homogeneous eosinophilic substance without a nucleus is found, and granulose cells with sparse and damaged layers are found around it.

Between the primordial eggs, i.e. in the interstitial, in some places, pregranular and celemic cells appeared in a relatively large number of collections, and in other areas they were sparsely located in small numbers. The blood vessels in the interstitial tissue are made up of small capillaries, and most of them are pale.

Microscopic examination of the ovaries of 3-day-old girls revealed the following morphological changes compared with newborns. At the same time, primordial eggs located in the

cortical layer of the ovary are relatively rare due to the development of a tumor in interstitial tissue. It is noted that they differ histotopographically and become of different sizes and shapes. In the middle of the primordial structures there are eggs stained with eosin darker than others, the nuclei are hyperchromic with hematoxylin, and primordial eggs with such a histological structure can be assessed as undergoing atresia. It was determined that granulosa cells surrounding them from the outside are also destroyed and undergo pathomorphological changes. In addition, the blood vessels in the intermediate interstitial tissue are full-blooded, and some of them are filled with diabetic blood. The difference from the previous period is that fibrous connective tissue has grown in some places of the interstitial tissue. It was found that pregranular and celemic cells are located in clusters of different sizes, unlike the ovaries of newborns.

It was found that histotopographic changes developing in the ovarian tissue of infants in the early postnatal period, that is, 20-30 days after birth, are also different. In some cases, there is a decrease in the number of primary primordial follicles, the appearance of sclerotic and atretized follicles, the appearance of isolated follicles among them, the appearance of an egg node. The remaining children were found to have cystic (Fig. 1) follicle atresia (Fig. 2) located in the peripheral parts of the ovarian cortex. It has been observed that mature and developed follicles are located in deep areas of the cortical layer, that is, near the core layer, and their area is due to the expansion of both the nucleus and the cytoplasm of the egg. In the early postnatal period, the primordial follicles in the cortex become of different sizes, the epithelium located on their inner surface is hyperplastic, and in some of them the oogonia apoptose and die. Follicles and corpus luteum in ovarian tissue are not detected in infancy. There is an overgrowth and an increase in connective tissue to varying degrees in the interstitial of both the cortical and the medulla of the ovary. Therefore, depending on the level of connective tissue proliferation in the ovary, ovaries of euplastic, hyperplastic and hypoplastic types are distinguished. The presence of an ovary in these three types depends on the morphophysiological specificity of embryonic ontogenesis. The main morphofunctional structures in ovarian tissue, including the number and quality of follicles, depend on its embryogenesis. As a result, morphological examination of the ovary in newborns leads to the identification of developed pathomorphological changes depending on the pathology during gestation. For example: children born to mothers with nephropathy have many cystic, obliterated and atretized follicles in the ovaries, hyperplasia of fibrous tissue and theca tissue in the stroma [2,8]. The ovaries of children born to mothers with cardiovascular diseases are 1.5 times smaller in size, and the vessel walls in their tissues are sclerosed.

Immunogystochemical testing is determined by protein-nature receptors located on the surface of cells that are sensitive to estrogen and progesterone, that is, antibodies that are specifically labeled. Since the epithelium of the ovarian tissue arises from the celemic epithelium, when the amount of sex hormones increases in the body, there are receptors that act on them, sensitizing to special hormones estrogen and progesterone. In immunogystochemical examination, the identification of these receptors using an antigen-antibody reaction-their positive staining with a specially labeled antibody-confirms the differentiation of the epithelial cell in the presence of these receptors, ovarian tachymyl finding.

The results of this immunogystochemical method are assessed as the following accepted terms, i.e. "strong positive reaction", "false positive reaction", "negative reaction", and "false negative reaction". Estrogen (ER-α) and progesterone (PR - α) in ovarian tissue were found in percentages for poor, moderate, and high expression of receptors.

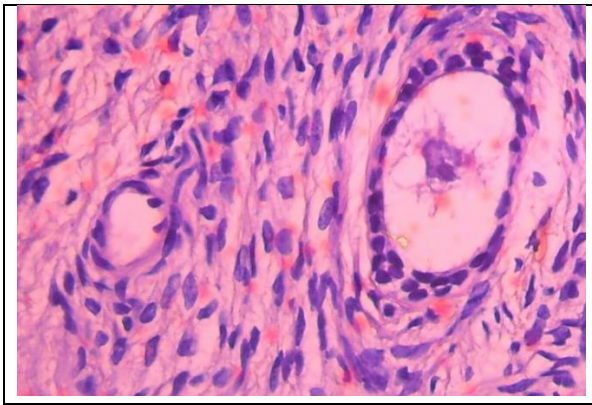

Figure 1. An 18-day-old child's ovarian follicle turned into a cyst. Paint: G-E. Floor: 10x40.

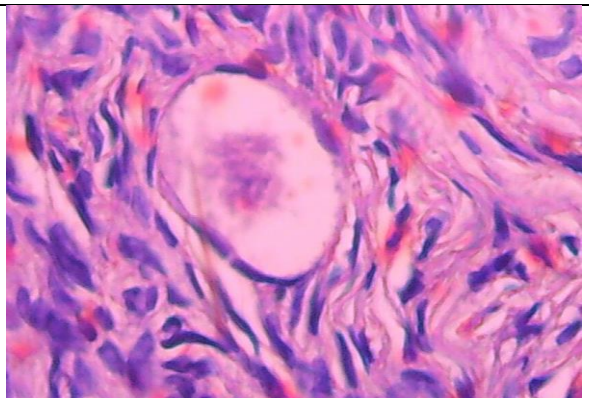

Figure 2. A 24-day-old child with follicle atresia in the ovary. Paint: G-E. Floor: 10x40.

Initially, a study of the marker Ki-67, which shows the degree of proliferation and proliferation of ovarian tissue cells during the early postnatal period, gave the following data.

The results of the examination showed that the expression of the cell proliferation factor was found to have different indications in the epithelial cells of the ovary we studied, as well as interstitial cells.

At 3 months of the early postnatal period, the proliferative index of Ki-67, an immunogystochemical marker of ovarian gland epithelial cells, was estimated at 27.16±0.13 indicators, which was confirmed to be at high levels.

Immunogystochemical marker Ki-67 proliferation index of connective tissue cells of the ovarian intermediate tissue was observed to be relatively high (38.64±1.41), and the condition was morphologically expressed in the dark brown form of Ki-67 marker in the nuclei of most of the histiocytic cells around the ovarian follicles (Fig. 3).

In this, the expression of epithelial cell nuclei in both carioplasm and nucleolus confirms the mid-phase, i.e. G2 phase, of cell activation. So, at 3 months of the early postnatal period in the ovarian tissue, it became known that epithelial cells develop relatively slowly, while intermediate connective tissue develops faster.

During the 3-month period, it was observed that in the epithelium of the forming follicles in the ovarian tissue, the marker Ki-67 was positively expressed in some cells, that is, the marker indicating proliferating activity in both basal layer and surface layer cells of the follicular epithelium was only positively expressed in some cells (Fig. 4).

During this period of the study, it was found that this immunogystochemical marker is relatively poorly expressed in the cells of the vascular wall and in the connective tissue cells of the intermediate tissue.

Conclusions. In the reproductive period, ovarian dysfunction may develop due to pathologies in embryonic ontogenesis.

Pathologies in the embryonic period can affect the development of the ovaries as dangerous factors, hypoxia, dishormonal phenomena, dystrophy and damage to ovarian tissue can develop, delay the development of the main morphofunctional structures of the ovary, cause destruction, necrosis, the development of reparative inflammation or hyperplasia in the fetal period.

At the same time, it is necessary to prevent early and late toxicosis, taking into account critical periods, and to maintain normal germ cell nuclei.

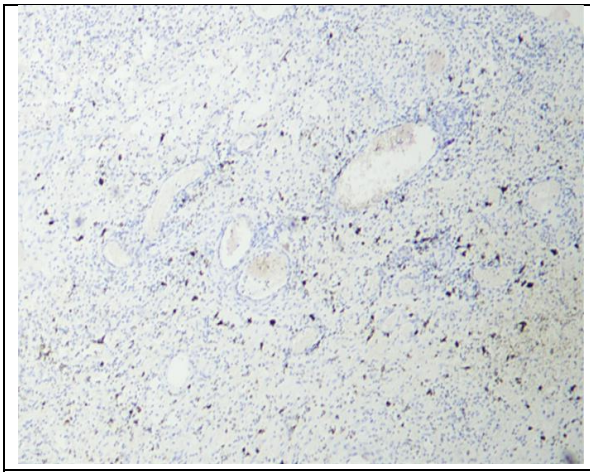	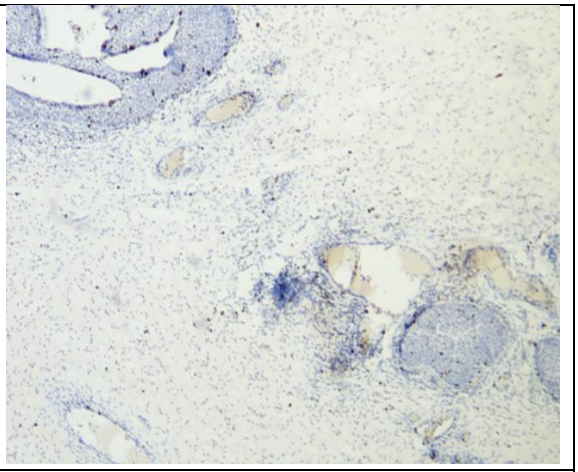
Figure 3. The early postnatal period is 3 months old, with Ki-67 low in epithelial cells in ovarian tissue, and higher expressed staining in stroma cells: immunogystochemistry. Floor: 10x20.	***Figure 2. Expression of the marker Ki-67 in the follicular epithelium and stroma cells in ovarian tissue during the 3-month period. Dye: immunogystochemistry. Floor: 10x20.***

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