

## **CHRONIC MOTHER HEPATITIS AND MORPHOLOGICAL FEATURES OF FORMATION OF THE IMMUNE SYSTEM IN THE PROPERTY**

BAKHTIYOR BURTHANOVICH KHASANOV,

DILDOR BAKHSHULLOEVA SULTANOVA,

SABOHAT BAKHODUROVNA AZIMOVA,

NARGIZA AKHTAMOVNA ORIPOVA,  
Bukhara State Medical Institute

### **ABSTRACT:**

**The morphological features of the development of the immune system of the offspring of female rats with chronic hepatitis were studied. Maternal heliotrin hepatitis contributed to an increase in mortality of rat pups 1-3 days after birth. In rat pups, violations in the development of the thymus of peripheral immune organs have been established during the period of early postnatal development.**

**KEY WORDS: hepatitis, mother, offspring, development, thymus, spleen, Peyer's plaques.**

### **INTRODUCTION:**

In recent years, the frequency of various extragenital diseases in women of childbearing age has been increasing. First of all, this refers to lesions of the hepatobiliary system due to past viral hepatitis [3]. Chronic lesions of the mother's liver cause various changes in hematological parameters, cellular and humoral immunity in the offspring [1, 2,5]. It was not possible to find information in the literature available to us regarding the effect of chronic maternal liver damage on the structural foundations of the formation of the organs of progeny immunogenesis. Meanwhile, a solution to this problem would make it possible to understand the mechanisms of immunodeficiency in children born to mothers

with liver lesions, and to substantiate the preventive correction and prevention of possible diseases in children.

The purpose of the study was to study in an experiment the effect of chronic heliotrin hepatitis on the reproductive function of female rats and the structural state of the organs of the immune system of their offspring.

### **MATERIALS AND METHODS**

The experiments were carried out on 50 sexually mature females of white outbred rats weighing 170-190 g. Animals were divided into 2 groups (25 rats each): experimental and control. A model of heliotrin hepatitis was obtained by weekly administration of 0.05 mg of heliotrin per 1 g of body weight for 6 weeks. The control group received sterile saline instead of heliotrin. After 10 days after the last injection, males were planted in the females. Subsequently, the course of pregnancy was observed.

It should be emphasized that toxic hepatitis had a significant negative effect on fertility and pregnancy. In all animals of the control group, pregnancy occurred, which successfully ended in childbirth. Of 84% of rats from the experimental group, pregnancy ended in childbirth in 64%, miscarriages - in 8%. The rest died during pregnancy.

The average number of pups from one mother in the control group was  $9.7 \pm 0.5$ , in the experimental group  $-6.3 \pm 0.6$ . With toxic hepatitis in the mother, the postnatal mortality of the offspring increased to 39.6% (6.2% in the control). Moreover, the highest mortality rate (28.7%) was observed on the 1-7th day after birth, (in the control 5.4%). The dead pups were excluded from the experiments. In total, 84 cubs from control females and 61 from females of the experimental group were included in the studies.

The pups were decapitated under mild ether anesthesia on the 1st, 3rd, 7th, 14th, 21st, and 30th days after birth. Pieces of the thymus, mesenteric lymph nodes, spleen and Peyer's patches were fixed in 12% neutral formalin or Buen's fluid, and after the corresponding wiring, they were poured into paraffin. Sections 5-7 mm thick were stained with hematoxylin and eosin and used for morphological and morphometric studies.

According to morphological studies, in newborn rat pups in the control group, the thymus is quite formed. The cortical and medulla are clearly differentiated. The density of the distribution of cells in the cortical substance is greater than in the brain. Among the cells, thymocytes, macrophages and reticuloepithelial cells differentiate. Reticuloepitheliocytes predominate in the medulla, and much less thymocytes. Gassal's little bodies are very rare.

Lymph nodes are represented by diffuse accumulations of lymphocytes and other mononuclear cells in the reticular stroma. Lymphoid follicles have not yet been formed. The absence of formed structural-functional zones is also characteristic of other peripheral organs of the immune system. The spleen in this period is mainly an organ of erythro- and thrombocytopoiesis. The organ parenchyma mainly consists of red pulp, in which numerous erythroblastic islets are located. The former

white pulp is absent. In Peyer's plaques, diffuse distribution of mononuclear cells throughout the stroma is also observed in the absence of clear boundaries of lymphoid follicles.

On the 7-14th day of the postnatal period in the lymph nodes, differentiation of the cortical and medulla is noted. At the same time, lymphoid follicles are forming. In the spleen, the formation of lymph nodes and the differentiation of their marginal and periarterial zones are also observed. The formation of lymphoid follicles occurs in Peyer's plaques.

On the 21-30th day of postnatal ontogenesis, the formation of structural and functional zones of peripheral organs of immunogenesis is completed, where the processes of lymphocyte, plasmacytopoiesis and antibody production occur.

In the experimental group, chronic hepatitis leads to severe structural disorders of the processes of postnatal formation of organs of the immune system in the offspring. In newborns, rat's differentiation of the thymus into cortical and medulla is quite pronounced. However, the distribution density of cells in the cortical substance is markedly reduced. Compared with the control group, the number of lymphoblasts decreased by 15%, small lymphocytes - by 20%. This trend continued in the subsequent periods of postnatal development of the thymus. Noteworthy is the increase in the number of destructive thymocytes, which at various times after birth were 2-3 times higher than the indices of the control group. Along with this, large macrophages with dense inclusions in the cytoplasm were found more frequently on the thymus sections of the experimental group than in the control, apparently also being a sign of enhanced thymocytolysis. The severity of the described changes decreased only by the 30th day of postnatal ontogenesis.

In the study of the peripheral organs of the immune system of experimental pups, a

significant delay in the postnatal formation of structural and functional zones was noted. On the 7-14th day of the experiments, the lymph node parenchyma consisted mainly of diffuse lymphoid tissue without clear boundaries of the cortical and medulla. Subcapsular sinuses were significantly expanded. The absence of formed lymphatic follicles during this period is also characteristic of the spleen and Peyer's plaques. On the 14th day, only the formation of small lymphoid follicles in peripheral organs was observed in rat pups of the experimental group. In the control group during this period, sufficiently formed lymphatic follicles were detected. Even by the 21st day of the postnatal period, in rat pups of the experimental group, the lymphoid tissue of the lymph nodes, spleen, and Peyer's plaques remained hypoplastic, the fuzzy borders of the various structural zones of the lymphatic follicles.

Postnatal formation of lymphoid tissue depends on many internal and external factors, among which environmental antigens are important [1]. With exogenous antigenic exposure, significant acceleration of the formation of lymphatic follicles and differentiation of their structural and functional zones was noted [2,6]. However, the natural formation of lymphoid tissue under the influence of environmental antigens can occur only under the condition of the normal course of the processes of embryonic bookmark and intrauterine development of the organs of the immune system. Undoubtedly, chronic hepatitis, accompanied by a number of metabolic disorders in the body, changes the natural course of embryonic development of organs and systems, including the immune system. These violations continue to manifest themselves in the postnatal period of life. Our data indicate a significant delay in the postnatal formation of organs of the immune system with toxic hepatitis in the mother.

## CONCLUSION:

1. Chronic heliotrin hepatitis in female rats leads to an increase in postnatal mortality of offspring by more than 3 times, with the highest mortality observed on the 1-3rd day after birth.
2. In rat pups born to mothers with chronic hepatitis, against the background of thymus hypoplasia, the formation of lymphoid tissue of peripheral immune organs is significantly slowed down.

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