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CHANGE IN THE EXPRESSION OF RECEPTORS TO WHEAT GERM LECTIN (WGA) ON EPITHELIORETICULOCYTES IN THE THYMUS OF RATS UNDER NORMAL CONDITIONS AND AFTER PRENATAL DEXAMETHASONE ADMINISTRATION

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Introductions: The influence of the thymus and its immunoendocrine interactions with other organs are of particular importance in childhood, ensuring normal development, maintaining immune reactivity and promoting adaptation to various environmental factors. The increased amount of glucocorticoids in the body reflects the state of stress and has a suppressive effect on the immune system.

The main events associated with the differentiation and maturation of T-lymphocytes occur within the epithelial reticulum of the thymus. It is known that the regulation of thymic functions is carried out by a large number of different signaling molecules secreted by cells of the microenvironment. The main functions of thymic epithelial reticulocytes are based on contact interactions with T-lymphocyte precursors. Contacts between epithelial reticulocytes and lymphoid cells are important for the transmission of growth and differentiation signals, for the implementation of selection and transmission of antigenic stimulus.

Thymic epithelial reticulocytes also secrete an endogenous lectin – galectin-1, which, by binding to oligosaccharide ligands of the cell membrane of thymocytes and lymphoblasts, mediates the adhesion of immature thymocytes to the epithelial cells of the thymus. The final residue of galectin-1 is N-acetyl-D-glucosamine, which, in turn, is specific for wheat germ lectin (WGA). The state of the thymic epithelial network

was studied taking into account the distribution of WGA^+-receptors.

Aim: To study the dynamics of wheat germ lectin (WGA) receptor expression on rat thymic epithelial cells in normal conditions and after prenatal administration of dexamethasone.

Materials and methods: The studies were conducted on 144 white rats on the 1st, 2nd, 3rd, 5th, 9th, 14th, 21st and 30th days after birth. There were 3 groups of 48 rats: group 1 – intact animals (Int), 2 – experimental group, which were intrauterinely administered 0.05 ml of 0.4% dexamethasone solution diluted 1:40 (Dex), group 3-control, which were administered 0.05 ml of 0.9% NaCl (K). The appearance of WGA^+-cells was recorded in the ImageJ program.

Results and discussion: The introduction of saline to the K group of animals did not cause significant changes ($p<0.05$) in the thymus compared to the Int group at all studied periods.

On the 1st-2nd day after birth, the density of distribution of receptors for N-acetyl-D-glucosamine on epithelial cells in the thymic cortex in rats of the Int and K groups is determined at a moderate (++), and in the Dex group - at a high level (+++). In the medulla, the intensity of expression is very high (+++) in all studied groups. From the 3rd day of life in the Int and K groups, and from the 5th day in the Dex group, a decrease in the intensity of expression of the WGA lectin label on epithelial cells to a moderate level (++) is determined in both the cortical and medulla of the thymus.

In the cortical substance, on the 9th-14th day, fluctuations in the intensity of receptor expression on WGA-epithelial reticulocytes in the Int and K groups are observed between weak (+) and moderate (++) levels. In contrast, in the Dex group of animals, it remains at a stable moderate (++) level. In the medulla of the thymus during the specified period, a significant increase in the level of expression to a high level (+++) is recorded in all studied groups.

After the 21st day and until the end of the observation period, the intensity of accumulation of the WGA lectin label on the surface membrane of epithelial cells decreases in all parts of the thymus and in all studied groups, while remaining higher

in animals in the experimental group (see Charts 1 and 2).

Chart 1

Intensity of expression of wheat germ lectin (WGA) receptors on epithelial cells in the thymus cortex of rats in the postnatal period

Day	Int	Dex	K
1st	++	+++	++
2nd	++	+++	++
3rd	++	+++	++
5th	++	++	++
9th	+	++	+
14th	++	++	++
21st	+	+	+
30th	+	++	+

Note: Int – intact group, K – control group, Dex – experimental group after dexamethasone administration.

Chart 2

Distribution of wheat germ lectin (WGA) receptors on epithelial cells in the medulla of the thymus of rats in the postnatal period

Day	Int	Dex	K
1st	+++	+++	+++
2nd	+++	+++	+++
3rd	++	+++	++
5th	++	++	++
9th	+++	+++	+++
14th	+++	+++	+++
21st	++	+++	++
30th	+	++	+

Note: Int – intact group, K – control group, Dex – experimental group after dexamethasone administration.

Conclusions: The increase in the accumulation of the WGA lectin label on thymic epithelial cells in animals in the experimental group (Dex) in both the cortex and medulla indicates the activation of intrathymic differentiation processes (positive selection of lymphocytes) and the processes of their preparation for emigration to the periphery. In addition, prenatal hormonal influence may reflect dystrophic dexamethasone-mediated changes in the cells of the microenvironment against the background of a compensatory increase in their functional activity.