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COMPARATIVE ASSESSMENT OF MORPHOLOGICAL AND MICROCIRCULATORY CHANGES IN THE THYMUS OF WHITE RATS IN ALIMENTARY ZINC (ZN) MICROELEMENTOSIS

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Abstract
In this study, a comparative analysis of morphological and microcirculatory changes in the thymus of white rats with alimentary zinc (Zn) deficiency was conducted. During the experiment, dynamic changes in the lymphoid structures of the thymus, the degree of differentiation of thymocytes, the cortico-medullary ratio, and the reaction of stromal elements were morphometrically assessed. Disorders of parenchymal-stromal balance of the thymus, morphometric indicators of lymphoid tissue, a decrease in the number of lymphoid cells, as well as an increase in the thickness of the vessel wall and a decrease in the internal diameter of the organ were revealed. The obtained results highlight the important role of zinc in immunohomeostasis and create a scientific basis for a broader understanding of the immunopathological mechanisms of microelementoses.

Keywords: Zinc deficiency, thymus, white rat, T-lymphocytes, immune system.The actual ministry.

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Introduction

Actuality: different chemical elements, in particular, is important in maintaining the health of the body's physiological activity and micronutrients. Micronutrients, growth, development, reproduction, lactation, it is necessary to provide gemapoez and other vital processes. The immune system depends on the amount of active in their body. Micronutrients in the body and is involved in regulation of mineral metabolism metabolitik provides all types of processes [8].

According to many experts, feeding its human health depends on the nature of the product. Human health, life expectancy and quality among the main role of micronutrients is important in maintaining the nutritional factors [4, 5, 9].

Zinc are essential micronutrients for all living organisms if it is involved in many biochemical processes in the cells [2, 6, 11, 13, 14]. Zinc is involved in the antioxidant potential of the cells in the immune reaction and the formation of T - and b-lymphocytes is an important element for the performance ofnis t [3]. The amount of zn regulatory Th1 reaction, ta'milaydi the integrity of the mucous membrane. Congenital immune cells to take zinc supplement components, technical antitelo reaction activates. Mikroelemeht has oxidants against the effects of stress [12].

The immune system of the body provides protection and adaptation to the effects of the different factors. Immunokompetent members in maintaining the body's immunological gomeostaz plays an important role in experimental and clinical conditions [1].

The condition of the immune kept in the thymus, an important member of the body aging and the development of diseases protection is one of them. This is the size of the gland, and the function will change depending on the age of architecture [7,10].

Yetishmovchiligida main pathogenetic mechanisms of zinc in the human body evolve, with many accomplishments in studying pathological cases, despite these micronutrients yetishmovchiligida configuration information on changes in the thymus is not sufficient.

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The purpose of the research is alimentar zinc yetishmovchiligida t of white ratswhich immorphology and its nest mikrosirkulyator consists of the evaluation of the features.

Material and Methods

Research was conducted in male rats than 80 without white seed. The rules of ethics on the use of animals in experimentation, Xelsinki the requirements of the congress will follow. Rats were kept in viva simple conditions. Experience in the laboratory of the animal's age, sex, weight, nutrition were kept correspond to the conditions in the environment. Tim morfofunktsinal two indicators to determine the structure of a group of animals was established. I group - normative (n=40); group ii – magnesium diet reached given white rats (n=40). For modeling a shortage of micronutrients German “Spezialfutter ALTROMIN gmbh & co. KG” prepared by the firm led to the use of a special feed. Special series no. feed 36/2024 have been provided with an official certificate. 2 sticks per day to rats in the control group were given the usual feed. Without special body weight in feed per day due to the experience of the group 2 sticks of 20 g were used.

The experimental and control groups was removed from the experiment the rats under anesthesia without the white seed was dekapitatsiya and air. The chest is open and tim extraction. Tim of the tissue portion of 10% formalin in fiksatsiya neytrallash am and after being washed in running water for 2-4 hours, which increased in concentration and spirtlar xloroform suvsizlantirildi, the wax block was prepared in accordance with generally accepted methods. Mkm wax blocks 4-6 thick cut down gematoksilin – eozin and van gizo was painted in the method. Tim okulyar of drug structure struktur-check mikrometr morfometrik was using. Thymus pieces of bark and kernels relative to the floor area (in relation to the total area of the incision), the bark of the floor width, shunihgdek,the inner diameter and the thickness of the walls of blood vessels was measured. Each of the five histological measurements in the view area of the incision was carried out. View of the area were selected on a random basis.

In order to study the structure of the cells of thymus limfoid, NOVELLA NLCD Model-307 (China) using a microscope, pitches immersiya under structural

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qismalarida of the thymus (subkapsulyar, kort the floor of the fields and kernels)on the number of cells was counted. Okulyar installed to count the number of cells was carried out using a microscope to morfometrik November.

Mathematical processing of data obtained during the research of morphological and morfometrik Pentium IV personal computer software package on the microsoft office Excel "7,0" matrisa was carried out at the general's. Thus, the standard deviation and reprezentativ will identify errors.

Digital information variatsion pumps was established in arifmetik average deviation, thus the average error and percent deviation from the control of the size variatsiya coefficient will be calculated. The statistical significance of deviations of the results obtained from the appropriate control method for comparison of two independent samples parametrik - Styudent eye (in the mode of the normal distribution) were assessed using. Differences of $p \leq 0.05$ statistical significance is that it has a value of up to. Issued to the organization of research in evidence-based medicine principles will apply.

Results and Analysis

Paired with one of laboratory animals of the thymus in the control group consists of two pieces, if you make it a part of to'sh in the lower third of the bone is located. 6 and 9 month healthy white seed capsule of the thymus of rats, respectively, the thickness of the gate without the field 5,82±0,32 and 5,97±mkm was of 0.38. The diameter of the proximal part Trabekulaning respectively 13,36±0,27 and 13,52±0,22 mkm, in the distal portion 10,28±0,14 and 10,43±0,22 determines that it is equal to mkm. Thymus area corresponding to the period of the age of the piece without 64,27±0,12% and 52,27 ± 0,48% accounted for.

Zinc deficientrats without the gate of the field in the thymus stained white seed group of white rats in the control group in comparison with the thickness of the capsule 6 monthly in the period of young 1,07 times, 9 month period in young 1,08 timesincreased. The diameter of both the proximal and distal part of the age of trabekulaning the period corresponding to the case of 6.5% and 7.3 per% to increased lekarzemqlanga. The 6 month period piece of the area of the thymus in young 1,07 times, 9 month period in young 1,08 times decreased.

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Healthy white seed kernels and thymus of rats of the portion of the tissue without histological prepretlarida po'sloq is the difference of the floor. Po'sloq kernels of the border between the exact expression and the floor was not. Parenximasi will identify the piece was replaced by fat tissue. The bark of the thymus in the control group 6 and 9 respectively of the floor area of laboratory animals monthly 63,86±0,37% and 58,83±0,26%, respectively, of the floor area 28,52 kernels±of 0.38% and 32,92±0,42 % accounted for (fig.1).Bark – the age of the index during the period of both kernels without becoming 2,24±0,16%, and 1,78±0,36% lekarzem is equal toqlanga. The thickness of the bark layer of the monthly period in young 248,27 6±11,54 mkm, in the period of 9 months young 165,27±9,76 was to mkm.

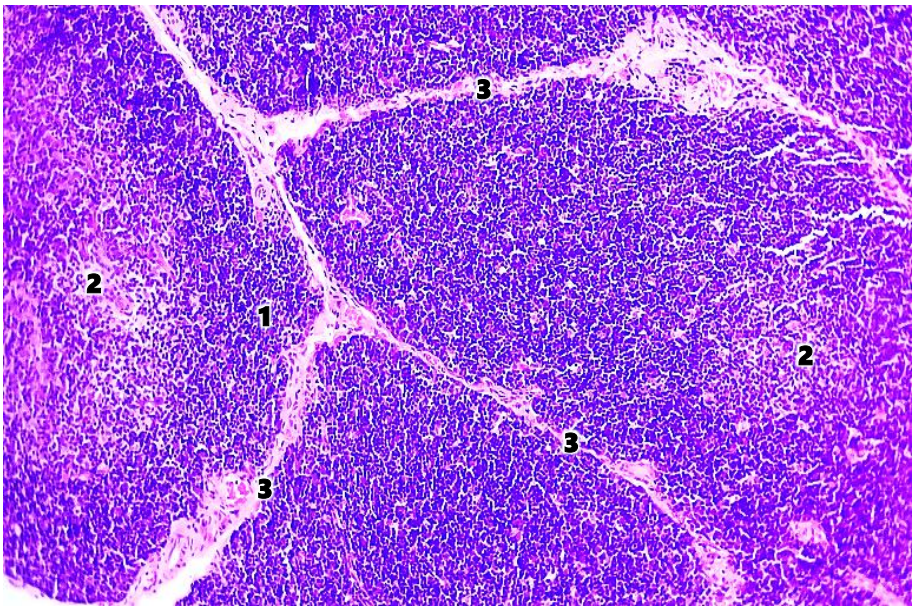

Figure 1. Thymus of a 6-month-old white rat in the control group. Stained with hematoxylin-eosin. Ok. 10 x volume. 10. 1st cortex, 2nd medulla, 3rd trabecula

Zinc shortage of the white bark of the thymus of rats in the group without intakt breed of white rats in comparison with 6-month age period in the floor area of 7,6 %, 9-month age period 8,3% respectively. The floor area during the period of the age of both kernels without becoming 1,07 timessince lekarzem is reduced toqlanga (fig.2). Bark – index both decreased during the period of the age of the kernels. Healthy white kalamshlar indicators in comparison with the thickness of

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the floor of the bark, 6 and 9 month age periodsida fit without 1,01,08 and 7 times respectively.

Healthy 6-month age period of laboratory animals of the thymus t-lymphocytes analyzed by a particular type when the amount of the floor of the bark in the field of small lymphocytes subkapsulyar 38,42±0,58%, 64,78 area kortiral+0,44%, kernels on the floor 34,28± 0,17% accounted for. The average amount of lymphocytes in the field of the floor of the bark subkapsulyar 17,58±0,26%, kortiral area 16,37±0,22%, kernels on the floor 31,26±0,18% is equal to. The amount of the floor of the bark in the field of large lymphocytes subkapsulyar 17,64±0,28%, kortiral area 6,32±0,12%, kernels on the floor 4,26±0,10% accounted for.

9 month age period, the thymus of rats in the control group without the bark of the white breed of small lymphocytes in the field of the amount of the floor subkapsulyar 33,46±by 0.41%, kortiral area 52,92+0,36%, kernels on the floor 26,12± 0,14% accounted for. Subkapsulyar the floor of the bark in the field of the average amount of lymphocytes 12,73±0,18%, kortiral area 11,94±0,16%, kernels on the floor - 32,27±0,22% is equal to. The amount of the floor of the bark in the field of large lymphocytes subkapsulyar 12,68±0,14%, kortiral area 4,26± 0,10%, kernels on the floor 3,19±0,16% accounted for.

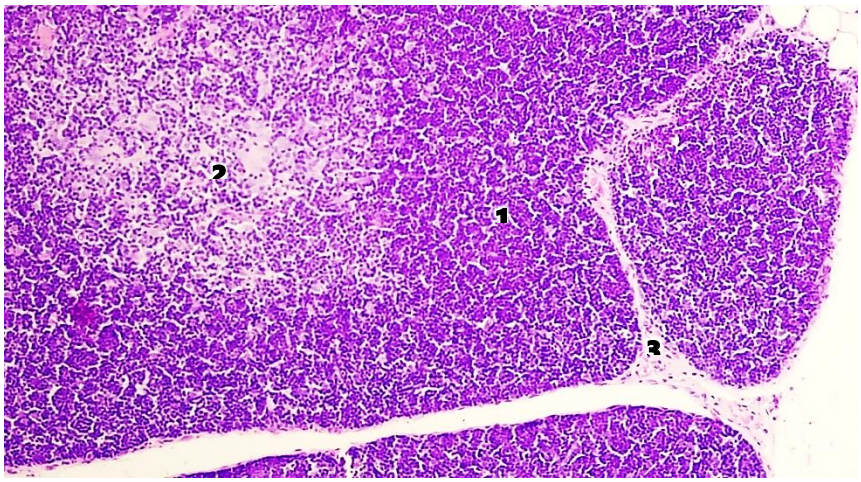

Fig.2. Thymus of a 6-month-old white rat in the group with alimentary zinc deficiency. Stained with hematoxylin-eosin. Ok. 10 x volume. 10. The area of the 1st cortical layer is reduced, the area of the 2nd medullary layer is increased, the 3rd trabecula is thickened.

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Zinc deficiency is called to fail to keepthe gan seed corresponding to the components of the thymus of rats in group 6 month without white holda small amount of lymphocytes 7,0%, 8,2%,7,2%, and the amount of medium lymphocytes 4,1%, 4,0%, and 7,0%, and the amount of large lymphocytes 6,1%, 2,1% and 2,0% respectively. 9 seed the thymus of rats in the experimental group corresponding to the components of the monthly white without case, a small amount of lymphocytes 8,1%, 9,1%, and 8,0%, and the amount of medium lymphocytes, 5,1%,5,2% and 6,8%, and the amount of large lymphocytes 7,1% , 2.0%, and 2,a1% reduction will determine the.

In the control group, 6-month age period of the thymus of rats breed without the white trabekulyar arteriolasining the thickness of the wall 17,38±0,43 mkm, while its internal diameter 19,42±0,18 mkm, the thickness of the capillary wall 5,27±0,16 mkm, internal diameter 5,79±0,42 was to mkm. The thickness of the wall to the floor arteriolasining the bark16,36±0,22 mkm, internal diameter17,94±0,27 mkm, the thickness of the capillary wall4,83±0,17 mkm, internal diameter5,67±0,24 mkm is equal to. The thickness of the wall to the floor arteriolasining kernelsand 14.78±0,16 mkm, internal diameteris 17.66±0,23 mkm, the thickness of the capillary wall4,97±0,18 mkm; inner diameter5,67±0,28 was to mkm.

9 month age period in laboratory animals trabekulyar the thickness of the wall of the thymus arteriolasining 18,14±0,12 mkm, while its internal diameter 19,78±0,32 mkm, the thickness of the capillary wall 5,52±0,17 mkm, internal diameter 5,87±0,14 was to mkm. The thickness of the wall to the floor arteriolasining the bark16,82±0,18 mkm, internal diameter18,38±0,28 mkm, the thickness of the capillary wall4,96±0,14 mkm; inner diameter5,82±0,13 mkm is equal to. The thickness of the wall to the floor kernels arteriolasining15,48±0,26 mkm, internal diameter (17,92±of 0.38 mkm, the thickness of the capillary wall5,24±0,12 mkm; inner diameter5,89±0,24 was to mkm.

Zinc deficiency is called to fail to keepthe gan group in the breed of white rats without trabekulyar arteriolasining the thickness of the wall without the corresponding period of the age of 1,07 1,05 times and increased, respectively, while the internal diameter increased to 1,02 times. Trabekulyar kapilyar wall

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qalihligi young 1,04 6 times the monthly period, 9-month period in young 1,02-fold increase was detected.Usnbu sezilarsiz the internal diameter of blood vessels at the leveldecreased. The thickness of the wall and the floor, the bark arteriolasi kapilyar 1,06 1,04 6 and 9 months of age and increased times respectively in the period. This period corresponds to the internal diameter of the blood vessels without 1,02 1,03 times the age of and, respectively.The floor kernels arteriolasining the thickness of the wall without the corresponding period of the age of 1,07-fold increased, respectively, while 1,05 times the internal diameter decreased. Kapilyar wall qalihligi6 month 9 month age period and increased times respectively 1,04 detected. The period corresponding to the internal diameter of blood vessels of the age of Usnbu without 1,03 times decreased.

Conclusion

The study revealed that zinc deficiency significantly affects the morpho-histological structure of the thymus in white outbred rats. In healthy animals, the capsule, trabecula, cortex, and medulla of the thymus have a relatively normal structure, and physiological involution processes characteristic of age periods have been noted. In zinc deficiency, the thickness of the organ capsule and trabeculae increased, the area of the thymus lobules significantly decreased, which indicates an increase in the relative area of stromal components and a decrease in the parenchymal part. The thickness of the cortex and its area decreased, and the cortical-cellular index decreased, which indicates a decrease in the proliferation and differentiation of T-lymphocytes. The relative area of the medulla also decreased, which indicates a decrease in the immunogenic activity of the thymus. A decrease in the number of all types of T-lymphocytes (small, medium, and large) was observed, which confirms the suppression of zinc deficiency, T-cell division, maturation processes, and the general immune response. In blood vessels (arterioles and capillaries), an increase in wall thickness and a decrease in internal diameter indicate the development of angiopathic changes. This can lead to disruption of thymus tissue trophism and metabolic processes. The research results indicate that the microelement zinc

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plays an important role in the functioning of the thymus and maintaining the cellular immunity of the body.

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