WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 2, Feb., 2022

FEATURES OF THE DYNAMICS OF MORPHOLOGICAL CHANGES IN THE LIVER OF LABORATORY ANIMALS UNDER EXPERIMENTAL ACUTE IRRADIATION

Sultanova L. D.
Bukhara State Medical Institute

Annotation
The aim of the study was to characterize the dynamics of morphological changes in the state of biocorrection in pigments and small intestine of laboratory animals under acute irradiation. It turned out that after acute irradiation in both groups, significant morphological changes were observed in the liver of laboratory animals with a relatively low intensity of morphological changes in group 1, in which no biocorrection was performed, in group 2, where preliminary biocorrection was performed. A similar situation was observed when studying the histological landscape of the small intestine of this white purebred sushlar rat, the intensity of morphological changes was lower than in white breeding rats that did not receive the biologically active additive "Lactopropolis-AWL".

Keywords: acute irradiation, liver and small intestine of laboratory animals, morphological changes, biocorrection

Introduction

In acute irradiation, the most sensitive organs are the organs of the immune system, the mucous membranes of the gastrointestinal tract, exoskeletal and endocrine glands, and sex glands. Organs with low sensitivity to radiation include the heart, kidneys, liver, head and back muscles, bone tissue, joints.During irradiation, the membrane of biological tissue becomes destabilized: an increase in membrane permeability leads to the activity of freely located proteins in the cytoplasm due to the penetration of fluid and many different micro- and macroelements into the cell, damage to intracellular structures of lysosomal enzymes and the development of hydropic dystrophy in the epithelium

It is as a result of venous overflow in the liver tissue that hypoxia of hepatocytes leads to the development of fatty degeneration of large, medium and small drops[4].

The aim of the study was to study and evaluate the dynamics of morphological changes in the liver of laboratory animals after biocorrection under acute irradiation.

Materials and methods.30 white breeds of male rats weighing 160-180 g were selected for experimental studies. All laboratory animals were taken from the same vivarium

and at the same age. All of them were stored in standard vivarium conditions (temperature 21-220 C, humidity 50-60%, light mode light and dark from 12 hours). Nuraliev N. Nuraliev N. Nuraliev N. Nuraliev N. Nuraliev N. Nuraliev N. Nuraliev N. Laboratory animals in vivarium conditions, care, compliance with the rules of biological safety and ethical principles when working with them. and co-founder. Implemented on [1, 5].

All laboratory animals were divided into the following groups:

Group 1 - unbiocorrected white sushlar rats with a standard vivarium diet receiving one-time acute irradiation in the amount of 5 gray (n=15);

Group 2 -5 received a single acute irradiation in the amount of gray, white undigested rats with the addition of a biologically active additive "Lactopropolis-SHILOH" as a biocorrection to the standard diet of the vivarium (n=15);

In the experiment, irradiation of laboratory animals was carried out using the gamma-therapeutic apparatus agat-R1 (Estonia), in which the radiation source was so-60.Studies on animal irradiation were conducted at the branch of the Republican Specialized Oncological and Oncological Scientific and Practical Center of the National Academy of Sciences of Uzbekistan in Bukhara.

The drug "Lactopropolis-AWL" was given every morning, due to the weight of all laboratory animals. Those who received acute radiation were given the drug for 20 days, irradiated on the last day, and then morphological studies were carried out on the 5th day, respectively.

The composition of the biologically active additive "Lactopropolis-SHILO" consists of an extract of Lactobacillus rhamnosus 925, probiotic bacteria Enterococcus durans and biologically active compounds of propolis with antimicrobial, immunostimulating, anti-inflammatory properties (a product of the Institute of Microbiology of UZR FA and LLC "Allwelllab").

To study the morphological parameters of laboratory animals in experimental studies, widely used methods (anatomical grinding) were used. All histological micro-objects were examined using a trinocular microscope (China) model HL-19 with software. Preparation of histological preparations from squid and small intestine without white samples consisted of 4 stages and was carried out by conventional methods. A mechanical rotary microtome of the YD-315 brand (China) was used to prepare the preparations, the prepared sections were lubricated with hematoxylin-eosin. Their photographing was carried out in microscopes of 4x10, 10x10, 20x10, 40x40, 60x10, 80x10 images.

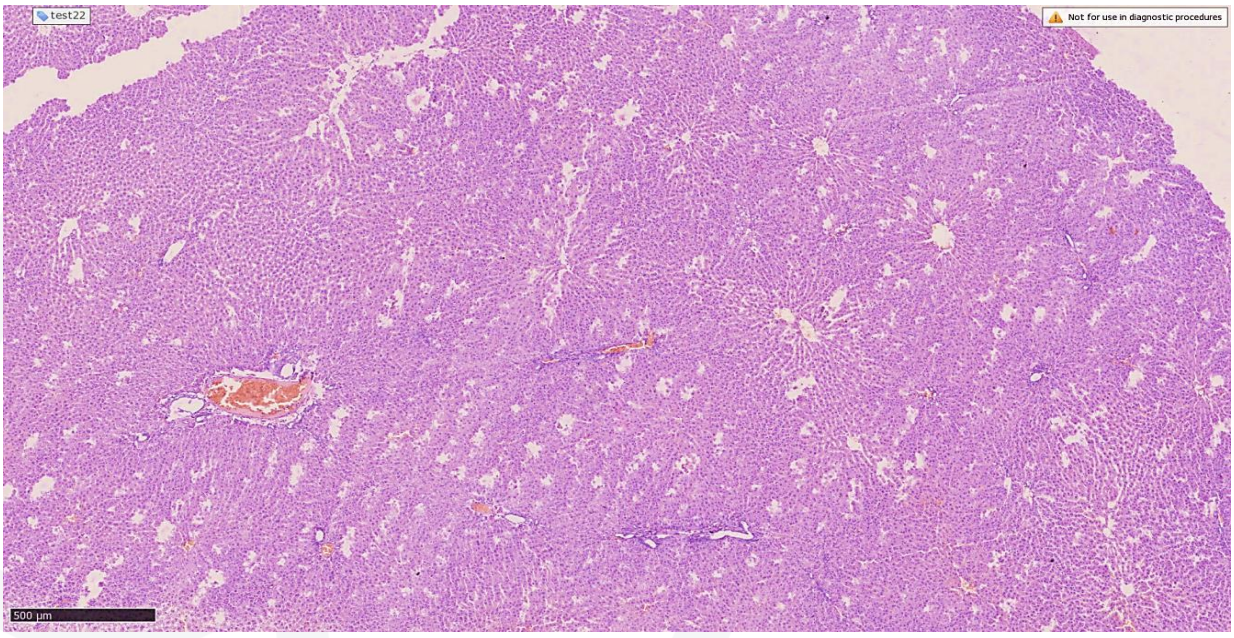
Statistical processing of the obtained data was carried out by calculating the following parameters: arithmetic mean (M), arithmetic mean error (m), standard deviation,

confidence interval. When organizing and conducting the study, scientifically based medical principles were used.

Results and their discussion.Since the changes in the effect of irradiation were poorly studied comparatively, the morphological properties of the liver under the influence of acute irradiation were studied and analyzed.

Since the morphology of the jigari of intact laboratory animals has been cited in many scientific studies [8], we have not studied the morphological structure of the liver within the norm.

The obtained results showed that in all laboratory animals of group 1 (100.0%, n=15), the fragmented structure of liver tissue did not change against the general background, a full-fledged type of venous vessels was found in the triad (100.0%, n=15) (Fig. 1).



1-picture. Histological appearance of rats with white pedigree who received acute irradiation(fragmented structure unchanged against the general background of liver tissue, triada vein blood vessel full-fledged appearance (1). Hematoxylin-painted with eosin, 4x10).

When microscopizing histological preparation made from rat liver without other white breeds in the same group, fat dystrophy foci were detected in hepatocytes around triads in the liver (86,7%, n=13), as well as sinusoidal cavities around the central vein (86,7%, n=13) (Figure 2).

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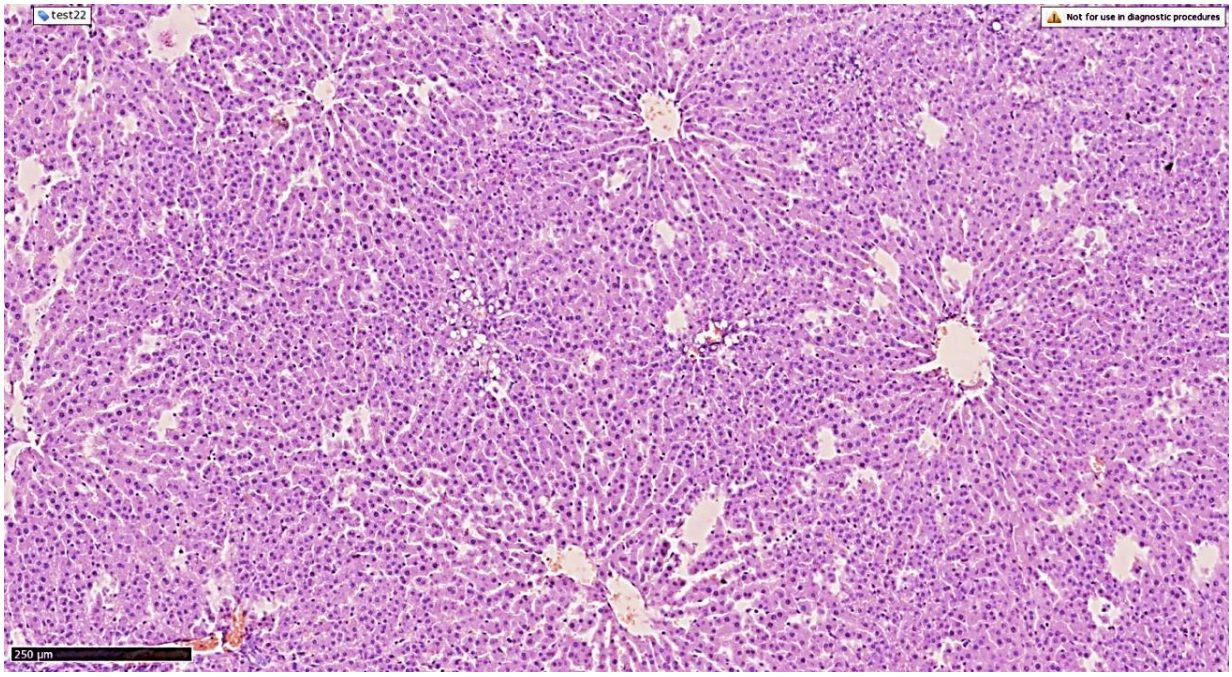

2-picture. Histological appearance of rats with white offspring who received acute irradiation (in hepatocytes around triads, fatty dystrophy foci are detected(1). Central venous atrophy sinusoidal cavities kengaygan (2). Hematoxylin-painted with eosin, 10x10).

In other histological drugs, the results of the study of Kupfer cells in the liver of laboratory animals belonging to the same group are presented. It is known that the Kupfer cells are formed from the monocytes of the circulating bone marrow, forming 20% of the cells in the liver, which are located within the sinusoids of the liver and are attached to the sinusoidal endothelial cells that form the wall of the blood vessels [7]. It was found that around the Triads, Kupfer cells were migrating (80,0%, n=12), large steatogepatocytes were detected around the periportal veins(86,7%, n=13). Their detection showed that against the background of fatty dystrophy in the liver there was an inflammatory process. Also, there were observed the presence of numerous monocellicular necrosis foci (73,3%, n=11) in hepatocytes (Figure 3).
Monocellular necrosis (celular - fat)-the location of hepatocytes, which are exposed to necrosis, is occupied by flatteners, is often observed in the liver, the cause of which is fatty dystrophy and necrosis of the liver.

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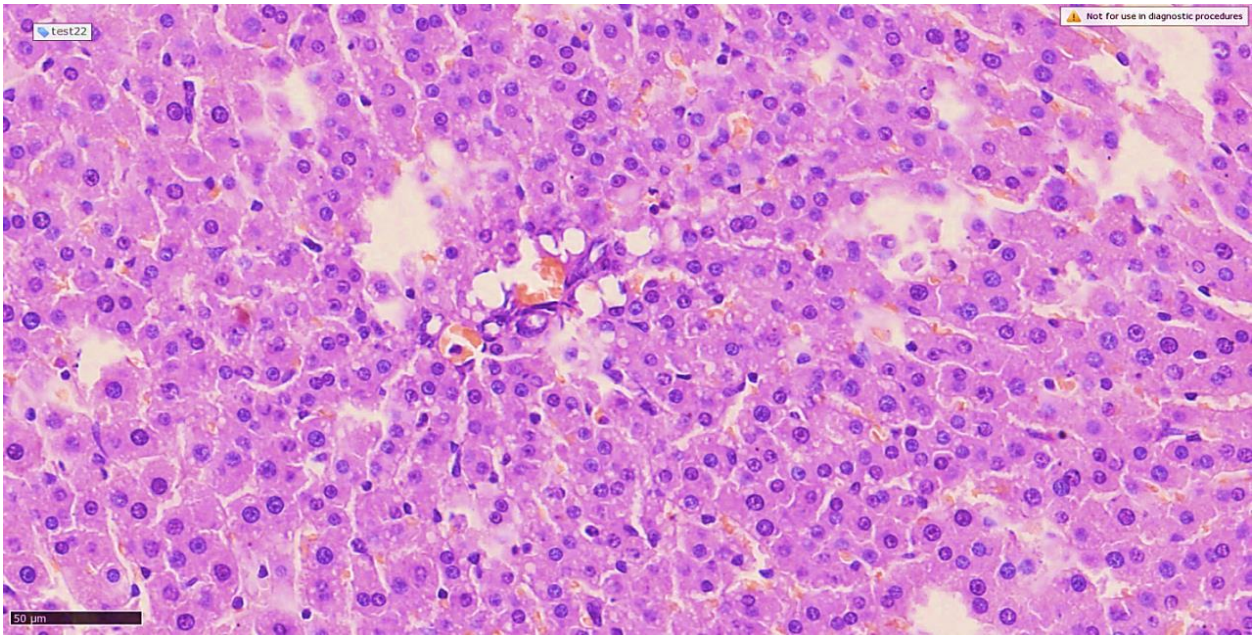

3-picture.Histological appearance of rats with no white breed receiving acute irradiation (1), large steatogepatocytes (2), numerous monocellicular necrosis foci(3)were detected around the periportal veins (2), migrating Kupfer cells around the Triads. Painted with hematoxylin-eosin. The 40x10.)

Continuing the study of histological drugs,in one of them fokus, large fat cells, silcigan hepatocytes with nuclei to the periphery were detected, at the same time focal focal foci of hepatocytes, which were exposed to gidropic dystrophy (66,7%, n=10), the remaining hepatocytes were exposed to medium-and small-fat dystrophy. It is known that gidropic dystrophy is the appearance of vacuoles filled with cytoplasmatic fluid in these hepatocytes. Perisinusoidal cavities (Disse cavities)are of the same width (Figure 4), and in the field of vision they are almost exactlylanm (93,3%, n=11).
Perisinusoidal spaces (Disse spaces) are a narrow space between the walls of hepatocytes and sinusoid capillaries in the hepatic compartment, the width of which is equal to 0,2-1,0 µm. In the Disse cavity, metabolism takes place between the hepatocytes and the blood plasma, it is also permissible to mention that in this cavity there are also itu cells involved in fibrogenesis [6].

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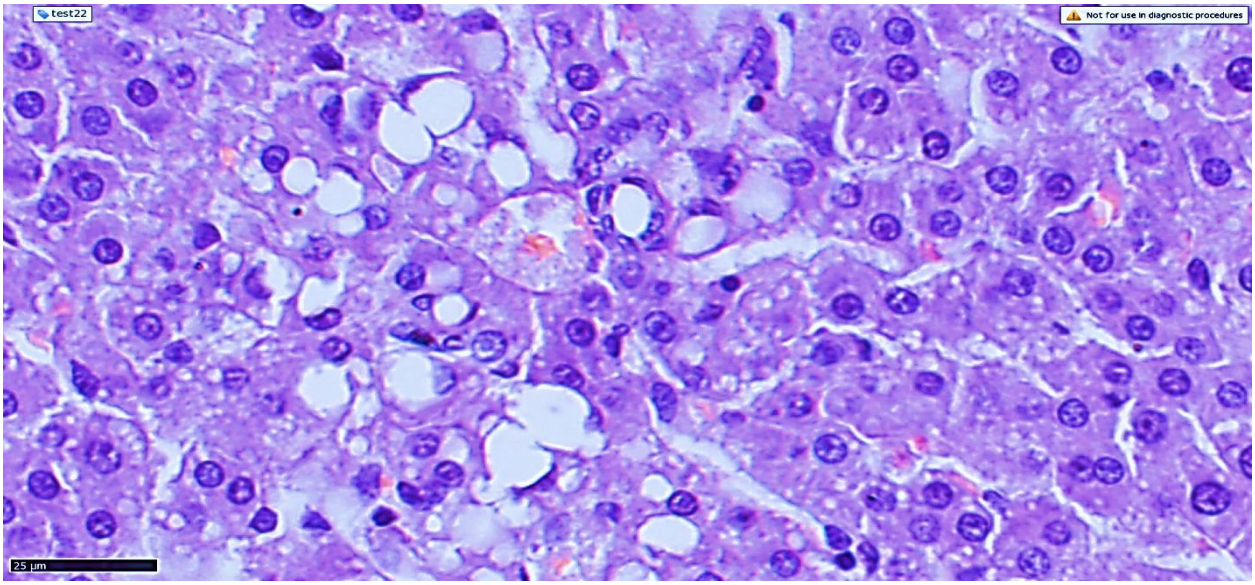
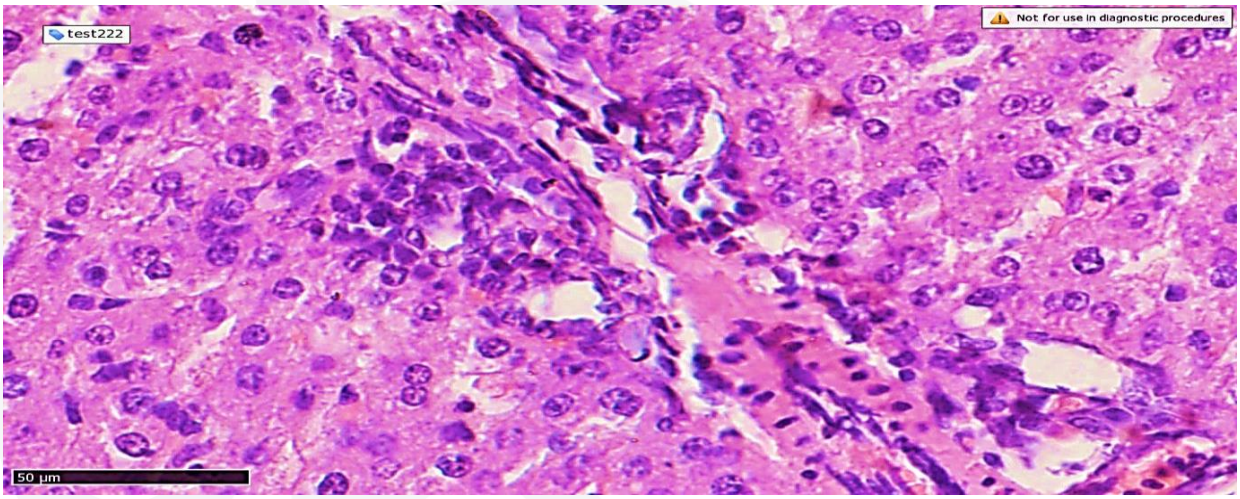


4-picture.Histological appearance of rats with white pedigree receiving acute irradiation(fokus large flattened hepatocytes, silcigan nuclei to the periphery (1), hepatocytes with hydropic dystrophy focal furnace (2), hepatocytes with medium and small fat dystrophy(3), sinusoidal cavities of different width (4), Disse cavities are almost pronounced. Painted with hematoxylin-eosin. 80x10).

In the next histological preparation of rat liver without white blood cell undergoing acute irradiation presented, migration of Kupfer cells around the peripheral vein blood vessel (80,0%, n=12) was observed, phagocytosis (66,7%, n=10) by Kupfer cells of Necrosis-Infected hepatocytes.



5-picture.Histological appearance of rat liver without white blood cell receiving acute irradiation (migration of Kupfer cells around the peripheral vein (1), necrosis of hepatocytes exposed to phagocytosis by Kupfer cells (2). Painted with hematoxylin-eosin. 80x10).

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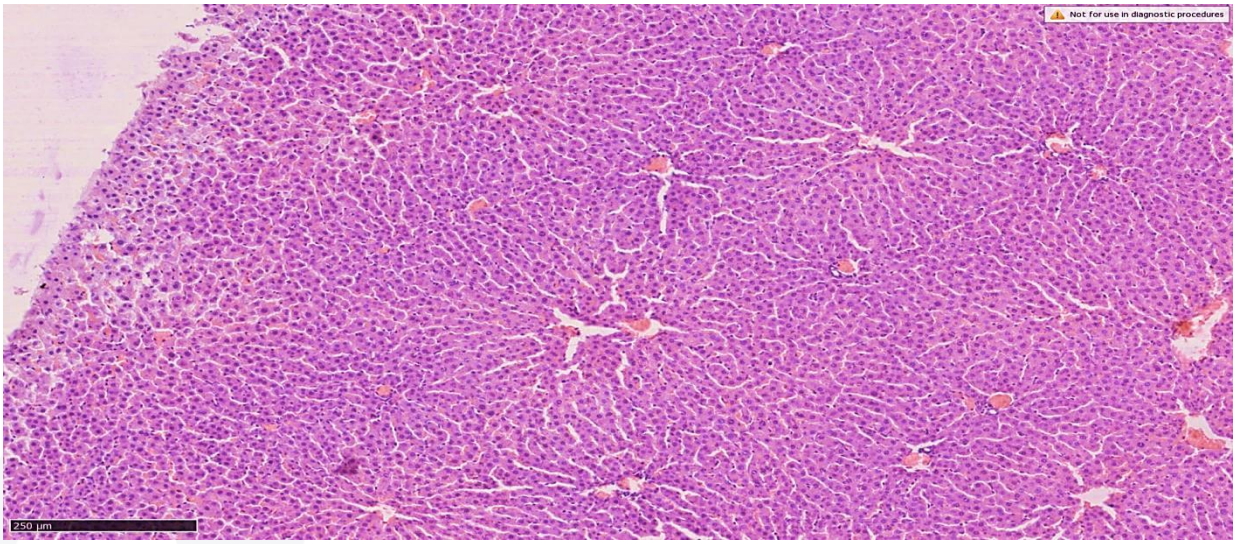
When the histological appearance of squidig jigari without white breed, which received the biologically active additive "Lactopropolis-AWL" before acute irradiation, was studied, it was found that most of them had the same thickness of liver tissue, capsule, clearly described reparative regeneration in subcapsular hepatocytes, the fragmented structure remained unchanged(100,0%, n=15). Uneven filling in the central veins, sinusoidal cavities around them were detected kengayg with a small amount (26,7%, n=4) (Figure 6).



6-picture. Histological appearance of rats with white offspring who received biopreparate before acute irradiation(liver tissue, capsule of the same thickness (1), reparative regeneration in subcapsular hepatocytes (2), segmental structure unchanged (3), uneven fullness in central veins (4), sinusoidal spaces around the trades kengaygan (5). Hematoxylin-painted with eosin, 4x10).

When the morphological (histological) appearance of rats with no other white breed belonging to the same group was studied, liver tissue, uneven saturation in the central vein, monocellicular necrosis (53,3%, n=8) in centrolobular hepatocytes, drop-shaped fat dystrophy foci (46,7%, n=7)in hepatocytes were detected from the chap in Figure 7 (Figure 7). As can be seen from the results obtained, the intensity of exposure to negative morphological changes in the liver of squid without white breed was lower in the 2-TH group than in the 1-th group.

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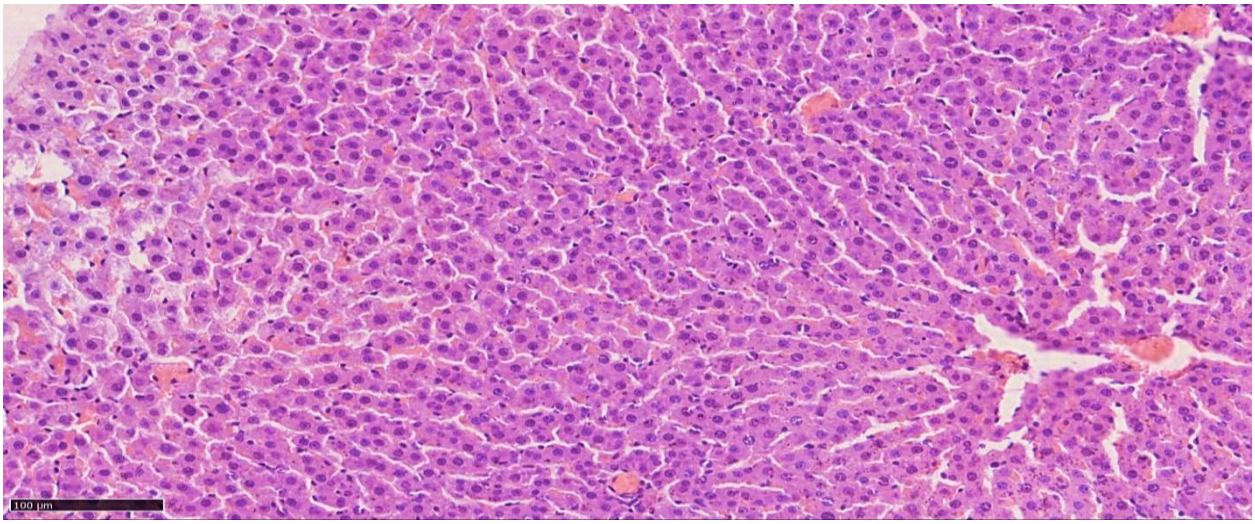

7-picture.Before acute irradiation, histological manifestations of rats with white pedigree who received biopreparate(hepatic tissue, uneven saturation in the central vein(1), monocellicular necrosis in centrolobular hepatocytes (2), dystrophy foci with a drop of hyaline, formed quietly in hepatocytes from the top of the chap, are detected (3). Paint G-E. It's 10x10.

Similar results were also observed in rats without other white breeds belonging to the 2nd group. For example, in the histological preparation under consideration (Figure 8), migration of Kupfer cells around the Triads (60,0%, n=9), apoptosis process in dystrophic altered hepatocytes and deformation of the nuclei(60,0%, n=9), narrowing of the sinusoidal cavities(66,7%, n=10) and fullness in the vessels of the peripheral vein were observed.

For the purpose of comparison with laboratory animals that did not receive biopreparate before acute irradiation (Group 1), we recognize that the following changes in the morphological characteristics of Group 2 animals were observed: "capillarization process" or "sinusoid capillarization phenomenon" (60,0%, n=9), most hepatocyte nucleus hyperchromia (60,0%, n=9), reparative regurgitation the process kuchaygan (93,3%, N=14) is also the same width around the sinusoidal spaces hepatitis (66,7%, N=10, sinusoidal voids were observed in the area with necrosis in hepatocytes (53,3%, n=8) (Figure 9).

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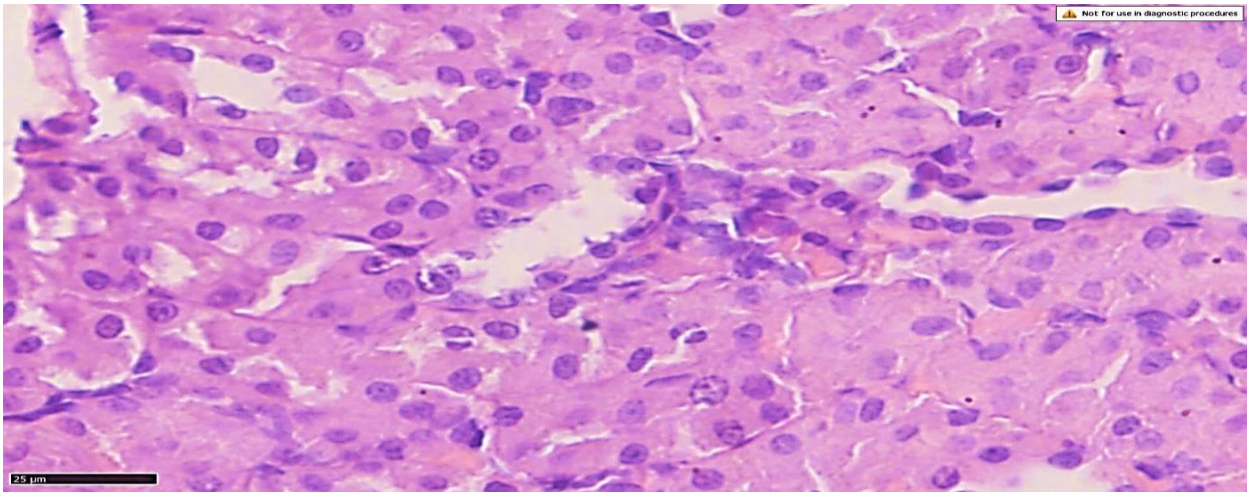

9-picture.Histological appearance of rat liver without white breed, which received biopreparate before acute irradiation ("capillary process" (1) around hepatocytes, hyperchromia of the core of hepatocytes(2), reparative regeneration process kuchaygan (3). Sinusoidal blanks are of the same width around the hepatocytes(4), sinusoidal blanks in the area exposed to necrosis in hepatocytes (5). Hematoxylin-painted with eosin, 80x10).

It is known that the closure of the functional intercellular space between the hepatocytes and the blood entering the gate vein system, in which the metabolism takes place, is called the "capillarization process" or "the phenomenon of capillarization of sinusoids", in which hypoxia develops, the process of fibrogenesis develops

From the results obtained, it can be seen that after acute irradiation in both groups, significant morphological changes were observed in the animal liver of the laboratory and morphological changes in the 2-TH Group, in which pre-biocorrection was performed, were low in intensity. Hence, the morphological changes of the liver in the influence of acute irradiation in rats without a white breed, which received the biologically active additive" Lactopropolis-AWL", were not evident in all animals, which in turn proved the effectiveness of this biopreparate and became the basis for its recommendation for its use for prophylactic biocorrection purposes.

Conclusions

1. Fat dystrophy foci (86,7%), sinusoidal cavities at the periphery of the Central vena cava (86,7%), migration of Kupfer cells to the periphery of the Triads (80,0%), large steatogepatocytes around the periportal veins (86,7%) were detected in the hepatocytes around the triads in the white non-bred rat liver of the 1st Group, which received acute irradiation and did not undergo biocorrection. Their detection showed

that against the background of fatty dystrophy in the liver there was an inflammatory process.

2. In the histological preparations of animals of this group, a focal focus of hepatocytes was also observed in hepatocytes, which suffered many monocellular necrosis foci (73,3%), hydropic dystrophy (66,7%), Disse spaces are almost clearly visible on the field of vision (93,3%).

3. Migration of Kupfer cells (80,0%) around the hepatic transportal vein without white blood cell undergoing acute irradiation was observed (66,7%, n=10) by Kupfer cells of Necrosis-Infected hepatocytes.

4. When the histological appearance of squidig jigari without white breed, which received the biologically active additive "Lactopropolis-AWL" before acute irradiation, was studied, it was found that most of them had the same thickness of liver tissue, capsule, clearly described reparative regeneration in subcapsular hepatocytes, the fragmented structure remained unchanged. Sinusoidal cavities around the central veins were detected in relatively small amounts (26,7%, n=4).

5. In order to compare with laboratory animals that did not receive biopreparat before acute irradiation (Group 1), the following changes were observed in the morphological characteristics of Group 2 animals: "capillarization process" (60,0%) around hepatocytes, the majority of hepatocyte nuclei were hyperchromous (60,0%), the reparative regeneration process kuchaygan (93,3%), sinusoidal cavities were observed in the same width around the hepatitis 66,7%), sinusoidal voids were observed in the area with necrosis in hepatocytes (53,3%).

6. After acute irradiation in both groups, significant morphological changes were observed in the laboratory animal liver, and morphological changes were low in the 2nd group, where pre-biocorrection was performed. Hence, the morphological changes of the liver in the influence of acute irradiation in rats without a white breed, which received the biologically active additive" Lactopropolis-AWL", were not evident in all animals, which in turn proved the effectiveness of this biopreparate and became the basis for its recommendation for its use for prophylactic biocorrection purposes.

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