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**MORPHOLOGICAL VARIATIONS OF SKELETAL MUSCLES OF  
RATS AT ACTION OF CAESIUM CHLORIDE**

*On the background of organ bloodcirculation disorder, sarcoplasm homogenization, dystrophic variations in muscular fibres of skeletal muscles, non-uniform bloodfilling of stroma's vessels, separate venules paresis of rats muscular tissue under caesium chloride action are revealed.*

Chemical environmental pollution and problem of influence of harmful chemical compounds on human and animals organism remain in the center of attention of modern science. Especially dangerous damages by toxicants take place in conditions of chemical accidents and disasters, this requires applications of not only specific antidotes, but also substances reducing penetration and accumulation into organism, or accelerate evacuation of toxicants [4]. Among technogenic pollutants the prominent parts is played by ions of heavy metals which even in micro doses can cause dangerous damages of sensitive anatomical-physiological systems and progress of pathological conditions [1, 2]. Heavy metals are characterized by high toxicity and biochemical activity, that allows to carry them to ecocide and biocide xenobiotics. Unlike xenobiotics of organic origin, which are subject to biotransformations by fermental systems of microorganisms and plants with formation of molecular-modified and less toxic compounds, heavy metals have features of toxicokinetics which are defined by their effective linkage with biomolecules, including functional groups of fibers, nucleic acids and low-molecular biomolecules without preliminary biochemical transformation [2]. This circumstance, alongside high speed migration and capacity to cumulation, creates preconditions for effective concentration of heavy metals in ecosystem components, including in vegetative and animal food stuffs, their further carry on trophic circuits and inclusion in human and animals organism cellular structures. In Ukraine there is a significant amount of biogeochemical provinces, in which soils and waters surplus of heavy metal of caesium is observed. Especially its quantity has increased after accident on the Chernobyl atomic power station. Unfortunately, till now there is not enough information on influence of stable caesium on morphological variations occurring in tissues of various organs at superfluous delivery in organism.

Objective of work. Objective of work became studying influence of caesium on morphological structure of skeletal muscles of poisoned animals. For researches young white laboratory male rats were used, weighing 180 - 200g. The Poisoning of rats occurred by introduction of caesium of chloride per os. Experience lasted 24 days. Researches are executed on two groups of animals, in each of which 10 rats have been selected on; the first group - control, the second-animals, poisoned with caesium chloride in a doze of 15,75 mg/kg.

For histologic research, material was selected from preliminary weighed animals from all groups under ether anesthesia. Slices of skeletal muscles for microscopic research cut

out from rats hind legs muscles. Material was located within 2-3 weeks in a 10% neutral formalin solution with triple change of fixative, then dehydrated in spirits of increasing concentration then filled in in paraffin blocks. Cuts in thickness 5-6 microns stained with hematoxylin eosin, were investigated in light-optical microscope and documented. This method helps to study the structure of striated muscular tissue of animals in norm, as well as the nature and depth of morphological variations, sequence of progress of dystrophic, necrobiotic and regenerative processes [4].

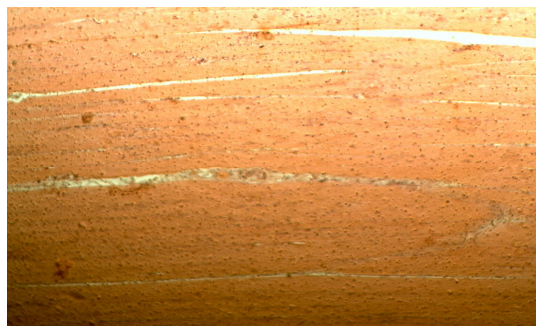
On cross-section histologic cuts, the skeletal muscles of rats from control group show bunches of the muscular fibres having various geometrical form between which there is a space filled with conjunctive tissue elements and vessels. Blood vessels on cross-section cut have also a various form - from circle up to the extended oval. On longitudinal histologic cuts the parallel orientation of capillaries and muscular fibres is neatly enough shown. In histology preparation of rats from control group, it is revealed that normal muscular fibres which are in regular intervals stained with hematoxylin eosin in pink color, their cross-section stria is revealed, contracture variations in muscular fibres don't show. Nuclei have oval-dilated form and is mainly on central position in cell. Vessels, both arterial and venous are not dilated, their walls have no signs of hypostasis or spasm [3]. Endothelium vessels are flattened, without growths in vessels inner' wall. Capillaries contain erythrocytes which do not leave from their walls (fig. 1.1.). In intermuscular space separate lymphocytes are detected.



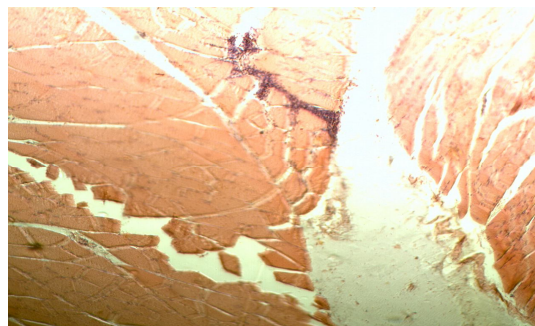
*Fig.1.1. Arteriole and venule in norm.*



*Fig.1.2. Venule spasm, perivascular extravasates.*



*Fig. 2.1. Skeletal musculature in norm.*



*Fig.2.2. Increase and oedema of perimysial cells.*

At histologic cuts microscopy of muscular fibres of experimental rats, contaminated with caesium chloride, it was revealed, that muscular fibres in the majority of fields of vision are increased in size due to an appreciable oedema, sarcoplasm is homogenized, cross-

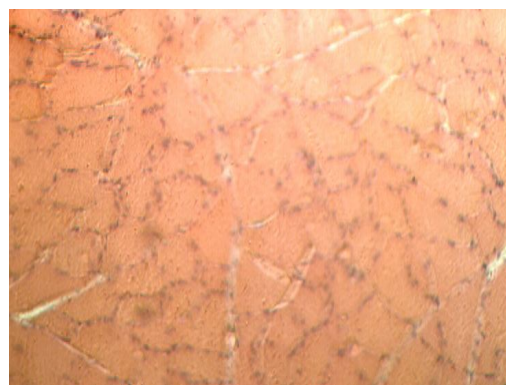
section stria is washed away, nuclei are hypochromic, slightly stained. Detected contours of muscular fibres are precise enough. A fibrous perimیزی conjunctive tissue is very friable, in places significantly oedematous in places (fig. 2.2.). Also it has been noticed, that perimیزی vessels are not uniformly filled with blood. In the majority of fields of vision, arterial vessels are barely filled, in places before occurrence of spastic condition are observed. Walls of arteries in a condition of strong oedema, are impregnated with plasma. There is a small amount of erythrocytes in vessels inner wall, or only blood plasma. in places are visible perivascular friable congestions of freely laying are visible erythrocytes, i.e. diapedesis-like haemorrhages.

In the background of organ bloodcirculation disorder, sarcoplasm homogenization and greasing of transverse stria are shown (fig. 3.2), that speaks about deep dystrophic changes in muscular fibres which can further lead to necrotizing skeletal muscles.

Appearance of plasmatic imbibition of blood vessels walls is often enough observed (fig. 4.2.), (walls of arterial vessels are damaged more often). On all hystology preparations basically there are signs of organ and tissue bloodcirculation disorder.



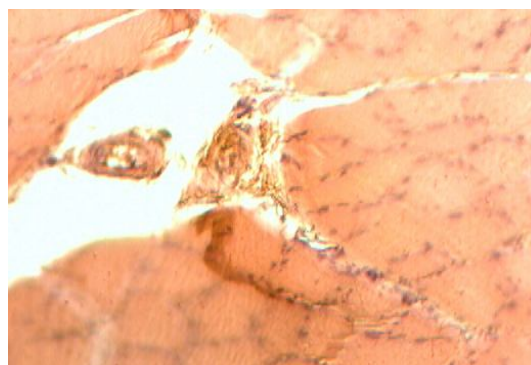
*Fig. 3.1. Sarcoplasm in norm.*



*Fig.3.2. Greasing of transverse striated structure of sarcoplasm.*



*Fig.4.1. Vessel in norm.*



*Fig.4.2. Plasmatic imbibitions of vessel wall.*

These signs are shown in the form of non-uniform bloodfilling of stroma vessels, of its oedema, and presence of fine friable diapedesis in it, paresis of separate venules, disorder of rheological properties of blood in the form of its stratification on plasma and corpuscular elements, oedema and perimیزی friability, presence of perivascular extravasates shows the destructive influence of caesium on a muscular tissue. The low degree of nuclei sensitivity to stain speaks about progress of the first stage of chromatin substance friability, that is fraught

with progress karyorrhexis - nuclei deaths, that can show the pathological influence of caesium cations on cellular structures functioning.

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### Анотація

**Морфологічні зміни скелетної мускулатури щурів за дії цезію хлориду / Єрмішев О.В., Коберська В.А. Мельникова Н.М., Присяжна І.**

Виявлено на фоні порушення органного кровообігу гомогенізацію саркоплазми, дистрофічні зміни в м'язових волокнах скелетної мускулатури, нерівномірне кровонаповнення судин строми, парез окремих венул м'язової тканини щурів за дії цезію хлориду.