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Combined Effects of Hypokinesia and Gamma Radiation on the Blood and Liver Tissue of Rats

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Annotation: Hypokinesia (in Greek - hypó - down, kínēsis - movement) is a decrease in the movement activity of the body due to the limitation of the volume and tempo of physical movements.

Keywords: physiological, pathological, rat, hypokinesia, skeleton, radiation, bone, stress, radiation, nucleus.

Hypokinesia (in Greek - hypó - down, kínēsis - movement) is a decrease in the movement activity of the body due to the limitation of the volume and tempo of physical movements.

Hypokinesia occurs in the human body due to diseases of the nervous system (Parkinson-Alzheimer), as well as professional activities (programmer, operator, accountant, etc.) associated with a sedentary lifestyle. On this basis, hypokinesia is classified into physiological, household living conditions, occupational activity, clinical, climate-geographical and school children types. It is noted that hypokinesia leads to a decrease in mental development, especially in schoolchildren [1; page. 7–8 page]. It is noted that hypokinesia (decreased motor activity) causes pathological morpho-functional changes in tissue cells of various organs in the body. [2; 6–7-p; 3; 247–248-p; 4; 180–181-pages.].

In this case, hypokinetic syndrome develops due to the limitation of functional activity of skeletal muscles [4; pp. 177–184]. Under the influence of hypokinesia, significant dysfunctional changes occur in the body and metabolism, respiratory system, blood circulation system, endocrine system function, K+ and Sa2+ ions in the kidneys. [2; 6-8-p.]

Hypokinesia is a stress factor [5; 4–6 p; 3; pp. 247-248]. During the period of scientific and technological progress, it is noted that the level of general physical activity in the personality society decreases, the development of diseases associated with nervous system tension, as well as the development of pathogenesis of various diseases against the background of long–term treatment of certain diseases and the activation of the aging process ahead of time, in turn, it is observed that hypokinesia becomes one of the urgent medical-biological problems [5; 4–5 p; 6; 7–8 p; 7; pp. 222–224].

In particular, under the influence of hypokinesia of a relatively long duration, regulation of the exchange of substances in the body is disrupted, electrolyte metabolism disorders, the development of atrophy and osteopenia in skeletal muscles are noted [3; 247-248-p.]. Also, under the influence of

hypokinesia, dysfunction of vegetative–viscral functions in the body, including the neurogumoral regulation mechanism of the cardiovascular system, is noted [5;7-8–p.]. Hypokinesia can act as a stress factor in the body of hot-blooded animals and humans [8; 508-511-p; 3; 248-249-p.]. In the modern way of life, a sharp decrease in the level of physical activity in the general condition in all physiological age groups and the occurrence of a serious medical and social problem associated with hypokinesia are noted, in turn, a full clarification of the mechanism of hypokinesia and the development of a complex of measures aimed at its prior acquisition is an urgent.

Studies have found an increase in serum cholesterol and β-lipoprotein concentrations after 1-60 days of hypokinesia in rats, and it is estimated that this condition negatively affects skeletal and muscular and myocardial functional activity [9; 275-276-p.]. In studies, it is noted that under the influence of hypokinesia, rats have an increased concentration of acetylcholine in the blood, a decrease in the content of catecholamines is detected, and this condition is expressed in the fact that parasympathetic regulation takes the leading place, in turn, the level of activity in the body decreases. Also, an increase in serotonin concentration and acetylcholinesterase activity under the influence of hypokinesia indicates a weakening of the function of the neuromediator system in the function of the brain. Studies have found rats to have a attenuation of movement activity value up to 91.4% under the influence of 45-day hypokinesia. LPO product in the study of prooxidant and antioxidant system activity in rat liver under experimental hypokinesia – malon dialdegidi (MDA) concentration thiobarbutaric acid in incubation conditions Ohkawa et al. (1979) significant changes in the activity of this system have been recorded when studied using the spectrometric method developed by [10; 351-353-p.].

In the 21st century, the formal and informal possession of nuclear weapons by states such as the United States, Russia, England, France, China, India and Pakistan means that there is a possibility of a global threat of mass nuclear weapons for direct humanity.

In addition, it is no secret that the need arises to have elementary knowledge related to the field of radiobiology in emergency situations related to the processing of radioactive sources and the storage areas of radioactive waste, the destruction of which is most likely to occur at nuclear power plants.

Currently, more than 40 countries around the world have reserves of permanent radioactic resources, which are used for the purpose of military defense, for the production of electricity, and also for scientific and practical purposes, and this circumstance determines the possibility of accidental man-made destruction at radioactive objects. Nuclear weapon test landfills, which have been in use since the 1950s, from the time of the escalating mass arms race ("Cold War") to the present day, it is noted that in many regions of the world under the influence of accidental accidents at objects with radioactive sources, radiacially environmentally safe zones have arisen. In particular, on the scale of the CIS countries, 10% of the territory is designated as a radiation hazard zone. 80% of the regions with such a description were found to correspond to the territory of Belarus, 30% to the territory of Ukraine, 40% to the territory of Kazakhstan, in Russia the territory of 1000,000 km2 is considered a highly calculated zone of radiation radiation hazard, and it is noted that more than 1000,000 inhabitants live in these regions.

Furthermore, your human body is constantly affected by cosmic radiation and natural radionuclides contained in water, soil, food, atmospheric air. In addition, currently, treatment using radiation radiation (radiotherapy) is a method of treatment using ionizing radiation in medical practice. Currently, mainly, the method of radiotherapy is used in the practice of treating tumor (cancer) diseases in 80% of cases. As preliminary information on the negative impact of radiation radiation on the human body, perhaps, in the 16th century T.Paratsels and g.It may be considered appropriate

to indicate the date of recording of an abnormal disease in the lungs of workers of mineral deposits by agricol. The mechanisms of primary action of radiation radiation on biological objects B.N.Studied in detail by Tarusov.

In particular, it has been noted that radiation radiation forms response reactions in biological organisms that occur in a chain description, that is, slowly, sequentially over time. In the 1950s B.N.It has been established by Tarusov that LPO products enhance the effect of radiation radiation. Also in the direction of the experimental study of the mechanism of action of radiation radiation on biological objects N.N.Semyanov, N.M.Emmanuel, E.B.Scientists such as Burlakova conducted scientific research. Disorders that occur in the cells of a biological organism under the influence of radiation radiation have an irreversible description, causing the origin of various diseases, including tumor ones. For example, the duration of the transition from the universe as a result of leukosis caused by exposure to radiation radiation is on average 10 years. The degree of probability of the origin of Tumor Diseases under the influence of radiation radiation is calculated depending on the dose of radiation. As a result of the studies carried out, it was found that 2 out of 1,000 babies born every 1,000 during the generations of the human organism (for 30 years) under the influence of radiation radiation of 1 Zv (100 ber) in the chronic description are born with a serious genetic defect. If, the effect of radiation radiation is recorded continuously, chronically, then the degree of probability of experiencing genetic mutations increases.

Also, biological organisms differ among themselves in the property of resistance to the effects of radiation radiation. For example, the recorded radiation value of 50% of animals irradiated for 30 days under the influence of radiation radiation is calculated for a guinea pig - 250 x - rays, for a dog - 335 X - rays, for a monkey – 600 x-rays, for mice-550-650 X-rays, for a snake-8000-20000 X-rays. During the study of the radiosurgery properties of organs and tissues in 1906, J.Bergone and L.The following law has been established by Tribonodo (Bergone-Tribondo principle): the faster the cells divide, the longer the duration of the mitosis cycle, and also the less differentiated the cells are, which means that the higher the sensitivity property to radiation exposure (radiation sensitivity law).

It is noted that low-dividing and highly differentiated cells are resistant to the effects of radiation radiation. According to the Bergone–Tribondo principle, blood-forming bone marrow cells, germ cells, intestinal and skin epithelial layer cells are considered to have a high level of sensitivity to the effects of radiation radiation.

Furhermore, the cells of the brain cells, muscle, liver, kidney, bone, cartilage and tendon ligaments are considered to be resistant to the effects of radiation radiation. It should be noted that lymphocytes, although they do not have the property of splitting and are sufficiently differentiated, but exhibit a high level of sensitivity to the effects of radiation radiation. As well, the property of the body's sensitivity to the effects of radiation radiation is also characterized by the mutual differentiation of tissues in its composition by the nature of the manifestation of a response reaction to various radionuclides. Including, ${}^{90}_{38}Sr$, ${}^{226}_{88}Ra$, ${}^{239}_{94}Pu$, ${}^{241}_{95}Am$, ${}^{238}_{92}U$ radioactive isotopes have been found to accumulate mainly in bone marrow cells. The origin of acute and chronic radiation sickness, cataracts, leukemia, anemia, lymphoma, myeloma, thyroid cancer, tumor diseases of the respiratory system organs, gastrointestinal cancer, bladder cancer, breast cancer, ovarian and seed cancer, skin cancer, bone cancer, brain tumor and other oncological diseases has been recorded in the human body under the influence of radiation radiation radiation [11; 125 - p.].

Studies have found a sharp attenuation of the level of locomotor activity in rats under the influence of experimental β- (0.15 gr) and γ-radiation (2 gr) [12; 26-p.]. In studies, it is noted that gamma(γ)-radiation causes oxidative stress in rat liver cells (hepatocyte), in turn, the activation of the

generation of active forms of oxygen (free radicals). In some studies, using the standard method for determining creatinfosphokinase activity and creatinine concentration in experiments carried out on the basis of determination using the method described in the work of the following authors, an increase in the concentration of MDA, NO, which is considered an LPO product in hepatocytes under the influence of γ-radiation (6 gr), as well as a decrease in the activity of antioxidant enzymes]. [13; 495–496-p.].

In addition, in research gamma (γ)–the morphological structure of rat liver after radiation is analyzed microscopically, using the method described by the following author [13; 499-500-p.]. In particular, studies have found that under the influence of γ–radiation, significant changes in the ultrastructure of rat liver cells occur.

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