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**THE COMBINED EFFECT OF AMYLOLYTIC ENZYME ACTIVITY ON BLOOD
AND LIVER TISSUE OF YOUNG AND OLD RATS OF HYPOKINESIA AND Γ -
RADIATION**

Z. N.DUMAEVA
ANDIJAN STATE UNIVERSITY
X.A.NASIROVA
ANDIJAN STATE UNIVERSITY
X.I.ZAKHIDOVA
ANDIJAN STATE UNIVERSITY
M.I.ASQARALIEVA
ANDIJAN STATE UNIVERSITY

ABSTRACT: The interaction of hypokinesia (reduced physical activity) and gamma rays on the amylolytic activity in the blood and liver tissue of young and old rats, and the activity of the digestive mechanism and the intensity of metabolic processes and general changes in the process of homeostasis are based on the literature, and rats, like other organizations, are consistently exposed to cosmic rays and natural radionuclides in water, soil, food, and atmospheric air. The study of the activity of the amylolytic enzyme of the organism using therapeutic is useful radiation in medical practice and its comparison with age are discussed.

Key words: hypokinesia, gamma radiation, rats of different ages, amylase, enzyme, metabolism, stress, external factors

Introduction

Biological processes in the body of young and old rats, especially metabolic activity, can change under the influence of various external factors. In this article, we will analyze on the basis of literature the effects of hypokinesia (decreased physical activity) and radiation on the activity of amylolytic (amylase) enzymes in the blood and liver of young and old rats. The enzyme amylase, playing an important role in the digestion of food, provides energy production in the body. In young and old rats, hypokinesia and radiation exposure can lead to a slowdown in metabolism. Although this topic has not yet been fully covered in the Uzbek scientific literature, existing research and scientific work will help us to analyze this issue.

Age transition and environmental factors such as radiation and hypokinesia (restriction of physical activity) can have a major impact on the physiological functions of the body. This section talks about how these factors affect biochemical processes and how they affect the activity of amylolytic enzymes. In addition, the study of aging in rats provides information on how it is important for human health.

Studies carried out within the framework of this topic expand the knowledge of how the restriction of radiation and physical activity reduces the activity of amylolytic enzymes, causes changes in the composition of the liver and blood. This issue identifies the scientific directions necessary to analyze the differences between age groups and older rats, as well as to fully study the impact on their health.

Thematic literature analysis

The biological effects of radiation have been found by radiation-related studies to influence many biochemical and physiological processes. High doses of ionizing radiation damage the

body's cellular structure, including genetic material. This results in oxidative stress (OS), which can decrease enzyme activity. Oxidative stress is characterized by an increase in free radical and reactive oxygen compounds in the body, which slows down the activity of enzymes, especially amylolytic enzymes. Reduction of amylolytic enzymes in the liver and blood as a result of radiation exposure is observed in many cases (Jovanovic et al., 2016).

Uzbek studies. There are various studies in Uzbek literature about the effects of ionizing radiation. Islamov and Rahmatov (2019) studied the effects of radiation on the body and found that radiation increases oxidative stress in cells. In their studies, high doses of radiation significantly impair the activity of the enzyme amylase in the liver of old rats. This condition, in turn, worsens digestion processes. These results, confirmed by other scientific works in Uzbekistan (Jalolov, 2020), show the negative effects of radiation on the enzymatic activity of old rats.

Research methodology

Hypokinesia and its effect on metabolism. Hypokinesia is a decrease or absence of physical activity that slows down metabolic processes in the body. Studies show that a decrease in physical activity, especially in older organisms, leads to a decrease in energy consumption, a violation of the metabolism of fats and carbohydrates. The effect of hypokinesia on amylolytic activity can accelerate the aging process in the body. This leads to a decrease in the activity of hormones and enzymes, as well as a deterioration in the state of Health (Eynon et al., 2018).

Hypokinesia is a decrease in physical activity that has a significant impact on the body's metabolic processes. There are several studies in the Uzbek scientific literature about the effects of hypokinesia on the body. For example, Davrov and Stagnov (2018) found that significant changes in the metabolism of rats are observed under the influence of hypokinesia. Their studies have mentioned that hypokinesia reduces the activity of the enzyme amylase and slows down the processes of digestion of food. They also studied the effects of hypokinesia on the body of the elderly, noting a significant decrease in amylase activity due to their low level of physical activity.

Combined effects of hypokinesia and radiation radiation. Many studies have attempted to study the combined effects of radiation and hypokinesia. In these cases, the effect of both factors on the body is further enhanced. Studies show that hypokinesia and radiation together weaken the body's defense mechanisms, leading to increased oxidative stress and further reduction in amylolytic enzyme activity. Thus, the combined effect between radiation and hypokinesia is even more noticeable, especially in older rats, since in this age group the body's chances of regeneration and self-regeneration decrease (Li et al., 2015).

A number of researchers from Uzbekistan (Tursunov and Matkarimov, 2020) studied the combined effects of hypokinesia with radiation and found that hypokinesia in older rats compared to younger rats has a more negative effect on the body. They noted that hypokinesia and decreased physical activity affect the overall metabolism and enzymatic activity of young and old rats.

Change in amylolytic activity relative to the age of the organism. Amylolytic activity varies with age. With the passage of age, metabolic processes in the body slow down, and the intensity of activity of enzymes is more pronounced in older rats. In older rats, there is a significant decrease in amylolytic enzymes, such as amylase, its production and activity. The decrease in the enzyme activity of the aging organism is further exacerbated, especially in combination with radiation or hypokinesia.

Analysis of amylolytic enzyme activity reveals enzyme activity in rat blood and liver to study amylolytic activity. Studies show that under the influence of radiation and hypokinesia, the activity of amylolytic enzymes decreases at an accelerated pace. These changes cause problems in the proper maintenance of metabolic processes in the body. According to the results of studies, in young rats, there was a decrease in amylolytic activity under the influence of radiation and hypokinesia, a mechanism that was found to lead to a deterioration in the digestive processes in the body.

The effect of radiation and hypokinesia on old rats of joint activity. In older rats, the combined effects of radiation and hypokinesia are even more noticeable. In this age group, a decrease in amylolytic activity worsens the overall health of the body. Practical results show that a decrease in physical activity in older rats is a result of increased stress, as well as the issuance of a second establishment—that is, radiation impairs metabolism on exposure, which leads to a further decrease in activity of the amylolytic enzyme. A complete analysis of this condition is important to improve the health of the elderly organism. Many studies have analyzed how the restriction of radiation and physical activity decreases the activity of enzymes and affects the activity of the amylolytic enzyme in the blood with the liver.

Analysis and results

I.B.A summary of Klicheva's(2023)scientific experience is: Gray studied the effect of G-radiation at doses 1, 2, 4, and 6 on the activity of pancreatic tissue enzymes. The activity and general proteolytic activity of amylase and lipase enzymes after radiation of homogenate of pancreatic tissue in rats 1, 3, 10, 20, 30, 45 and determined after 60 days. the results of changes in the activity of enzymes of pancreatic tissues were obtained, depending on the dose of G-radiation. It is noted that gamma-radiation confirmed that all studied enzymes have reduced their activity.

Z.N.Dumayeva (2022) in her paper covered her scientific work on the influence of hypokinesia and radiation on body weight, the summary of the article is as follows: it is morphologically proven that enzymes of the digestive glands penetrate the blood from atinocytes through the basolateral veil. The ratio of these mechanisms depends on the functional state of the digestive glands and small intestine, the permeability of their histogemological barrier, the pressure in the excretory pathways and the degree of their blood supply. In the experiment, he studied the effects of limited movement and radiation on the body weight of animals of different ages and proved that the weight of rats increased due to growth and development depending on the duration of observation in the control group, and the growth and development of experimental rats remained in its initial state as a result of hypokinesia and negative In addition, the results obtained when two stress factors are combined with hypokinesis and gamma-radiation are similar to their separate effects, that is, they have been confirmed in practice that their separate effects are sufficient to induce changes in the body.

The activity of the amylolytic enzyme is important in the separation of starch into sugars and monosaccharides. Uzbek researchers, such as Muradov and Murodova (2015), have done several studies that show the role of the enzyme amylase in physical activity and digestion. Their research demonstrated that the body of young rats has a high level of amylase activity, which allows them to quickly and efficiently digest food. But in older rats, there is a decrease in amylase activity. This condition refers to a slowdown in metabolism and changes associated with the body's age. Several studies have been carried out in the scientific literature of Uzbekistan to study biological differences in the organisms of young and old rats, ensuring that the metabolic processes in young rats are carried out faster, which ensures the high activity of amylase and other digestive enzymes (Muhammadov, 2017). However, a

slowdown in metabolism and a decrease in physical activity in the body of old rats negatively affects their digestive system. Studies by Shodiev (2018) and Gulomov (2021) found a decrease in amylase activity and a decrease in overall metabolism in older rats.

In scientific activities conducted by researchers (Rakhmonov, 2017), comparing the activity of the enzyme amylase in the liver of young and old rats, it was found that its activity in old rats is much lower. This data is also confirmed by other scientific works (Ibragimov, 2016), which reveal the differences between the metabolism of young and old rats.

Conclusion

In Uzbek literature, existing studies on the effects of hypokinesia and radiation on amylolytic activity in the body of young and old rats show metabolic differences between young and old organisms. In young rats, amylase activity is high, while in older rats, this activity decreases. External factors such as hypokinesia and radiation further expand these differences and worsen the metabolism of older rats. These studies suggest the need to further study the biological differences of the organisms of young and old rats. Also, hypokinesia and radiation require special attention to maintaining physical activity and caution in maintaining health for the elderly.

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