MORPHOLOGICAL FEATURES OF THE INFLUENCE OF GENETICALLY MODIFIED SHADOW ON THE HEPATOBILAR SYSTEM IN THE EXPERIMENT

Avozmetov Jasurbek Egamberganovich
Bobojonov Rustam
Urgench State Medical Institute

Annotation: *In recent years, the widespread use of genetically modified products in the food industry requires a thorough study of their effects on the body. In this study, the influence of genetically modified soybeans on the hepatobiliary system, in particular, on the morphological state of the liver, was assessed under experimental conditions. The experiments were conducted on white outbred rats and analyzed macroscopic and microscopic indicators of the liver, as well as the main biochemical markers in the blood. The obtained results showed that the consumption of genetically modified soybeans leads to significant morphological and functional changes in liver structure.*

Keywords: *gen-modified shade, hepatobiliary system, liver, morphology, experimental research.*

INPUT

The issue of stable provision of the population with food products is one of the urgent problems facing modern society [2,11,17,21]. To meet this need, products based on genetically modified organisms are widely used. In particular, genetically modified soybeans occupy one of the leading positions in the global food market [3,7,13,19].

At the same time, there is a growing number of scientific data that long-term consumption of genetically modified products can cause various pathophysiological changes in the human and animal body [1,8,14,22]. In the literature, it is noted that against the background of consuming genetically modified soybeans, functional and structural changes are observed in the liver, kidneys, and reproductive system [5,10,18].

The hepatobiliary system is the central link in metabolic processes in the body. Detoxification, protein, fat, and carbohydrate metabolism are carried out through the liver. Therefore, potential toxic factors in food are primarily manifested in the morphology and function of the liver [6,12,15].

This study is aimed at morphological and biochemical assessment of the effect of genetically modified soybeans on the hepatobiliary system in the experiment [4,9,16,20].

Materials and methods

The research was conducted experimentally. 90 white outbred male rats weighing 160-180 g were involved in the experiment. The animals were divided into three groups: the control group and the experimental groups, which were fed genetically modified soybeans.

The animals of the control group were fed with a standard ration. Genetically modified soybeans were added to the diet of animals in the experimental group for a certain period. At the end of the experiment, the animals were decapitated in accordance with standard ethical requirements, and liver tissue was taken for examination.

In the process of macroscopic assessment of the liver, its size, color, consistency, and surface condition were studied. Histological preparations were prepared from liver tissue for microscopic examination and evaluated under a light microscope.

Biochemical analyses were carried out by determining the indicators of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in the blood. The obtained results were processed using statistical methods, and the level of reliability was taken as $p<0.05$.

Results

According to the research results, a number of significant changes were detected in the liver of animals that consumed genetically modified soybeans. Macroscopically, liver enlargement, darker color, and softened consistency were observed. The relative mass of the liver was significantly increased compared to the control group by 100 g of body weight.

Microscopic analysis revealed diffuse dystrophic changes in the liver parenchyma. In hepatocytes, edema, vacuolization, elements of fatty dystrophy, and dilation of sinusoids were noted. In some areas, signs of vascular congestion and pericellular edema were encountered.

Analysis of biochemical parameters showed a significant increase in the level of ALT and AST in the blood compared to the control group. This condition is explained by damage to the membranes of liver cells and the release of enzymes into the bloodstream. It was established that there is a direct relationship between morphological changes and biochemical indicators.

Discussion

The obtained results indicate that the consumption of genetically modified soybeans causes structural and functional disorders in the hepatobiliary system. Diffuse dystrophic changes detected in the liver tissue may be associated with an increase in metabolic load and toxic effects.

An increase in ALT and AST indicates the development of cytolysis of liver cells. Compared with the data presented in the literature, the results of this study confirm the hepatotoxic potential of genetically modified products.

The combination of morphological and biochemical changes indicates that the liver condition is an important prognostic criterion in assessing the degree of influence of genetically modified soybeans on the body.

Conclusion

The results of the experiment showed that the consumption of genetically modified soy leads to significant morphological and functional changes in the hepatobiliary system in white outbred rats. An increase in liver volume and relative mass, the

development of diffuse dystrophic processes in hepatocytes, and an increase in the level of liver enzymes in the blood confirm the hepatotoxic effect of this product.

The obtained data indicate the need for widespread use of morphological criteria in assessing the medical and biological safety of genetically modified products.

REFERENCES:

1. Adilbekovich, B. U., & Yuldashevna, A. R. (2025). EPIDEMIOLOGICAL CHARACTERISTICS AND AGE-RELATED CLINICAL ASPECTS OF EPILEPSIA IN CHILDREN. Научный Импульс, 4(40), 197-200.

2. Adilbekovich, B. U., & Yuldashevna, A. R. (2025). ETHIOPATHOGENESIS IN CHILDREN'S EPILEPSIA: MODERN VIEWS AND THE CONCEPT OF EPILEPTIC NEURON NETWORKS. Научный Импульс, 4(40), 211-215.

3. Adilbekovich, B. U., & Yuldashevna, A. R. (2025). EVALUATION OF EPILEPSIA AND EPILEPTIC SYNDROMES BASED ON THE CLASSIFICATION OF EPILEPTIC SEIZURE ILAE 2025. Научный Импульс, 4(40), 201-205.

4. Adilbekovich, B. U., & Yuldashevna, A. R. (2025). INTERACTION OF ECOLOGICAL FACTORS AND GENETIC PREDISPOSITION IN CHILDREN'S EPILEPSIA. Научный Импульс, 4(40), 206-210.

5. Avozmetov, J. E. (2020). Influence of a Genetically Modified Organism on the rat's hepatobiliary system. European journal of Molecular & Clinical Medicine, 7(8), 1235-1237.

6. Avozmetov, J. E. (2021). ASSESSMENT OF THE EFFECT OF GENETICALLY MODIFIED FOODS ON HUMAN BODY. In НАУКА И СОВРЕМЕННОЕ ОБЩЕСТВО: АКТУАЛЬНЫЕ ВОПРОСЫ, ДОСТИЖЕНИЯ И ИННОВАЦИИ (pp. 116-118).

7. Bobojonov, U., & Sadikova, G. (2021, January). CLINICAL AND DIAGNOSTIC CHARACTERISTICS OF CHILDREN'S EPILEPSY LIVING IN THE ARAL SEA REGION. In Конференции.

8. Egamberganovich, A. J. (2020). Influence of a genetically modified organism on the Rat's hepatobiliary system. European Journal of Molecular and Clinical Medicine, 7(8), 1235-1241.

9. Egamberganovich, A. J. (2021, March). EVALUATION OF THE EFFECT OF A GENETICALLY MODIFIED PRODUCT ON THE MORPHOLOGICAL PARAMETERS OF THE LIVER OF LABORATORY ANIMALS. In Archive of Conferences (Vol. 17, No. 1, pp. 114-118).

10. Egamberganovich, A. J. (2025). MORPHOLOGICAL CHARACTERISTICS OF THE EFFECT OF A GENETICALLY MODIFIED PRODUCT ON THE HEPATOBILIARY SYSTEM IN AN EXPERIMENT. Научный Импульс, 4(40), 389-392.

11. Egamberganovich, A. J. (2025). MORPHOLOGICAL FEATURES OF THE INFLUENCE OF A GEN-MODIFIED PRODUCT ON THE HEPATOBILAR SYSTEM IN THE EXPERIMENT. Научный Импульс, 4(40), 188-191.

12. Egamberganovich, A. J. (2025). STUDY OF THE MORPHOLOGICAL EFFECT OF A GEN-MODIFIED PRODUCT ON THE HEPATOBILAR SYSTEM IN AN EXPERIMENT. Научный Импульс, 4(40), 184-187.

13. Egamberganovich, A. J. (2025). STUDYING THE RELATIONSHIP BIOCHEMICAL INDICATORS OF LIVER AND BLOOD OF EXPERIMENTAL ANIMALS UNDER THE INFLUENCE OF GENETICALLY MODIFIED SOYA. Научный Импульс, 4(40), 192-196.

14. Авозметов, Ж. (2021). Структурные и морфологические изменения в поджелудочной железе крыс после введения генетически модифицированного продукта. Общество и инновации, 2(7/S), 204-209.

15. Авозметов, Ж. Э. (2021). МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВОЗДЕЙСТВИЯ ГЕННО-МОДИФИЦИРОВАННОГО ПРОДУКТА НА ПЕЧЕНЬ В ЭКСПЕРИМЕНТЕ. In WORLD SCIENCE: PROBLEMS AND INNOVATIONS (pp. 153-155).

16. Авозметов, Ж. Э. TIBBIYOTDA ANGI KUN. TIBBIYOTDA ANGI KUN Учредители: Бухарский государственный медицинский институт, ООО" Новый день в медицине", (4), 9-11.

17. Авозметов, Ж. Э., & Хасанова, Д. А. (2021). НОВЫЙ ДЕНЬ В МЕДИЦИНЕ. НОВЫЙ ДЕНЬ В МЕДИЦИНЕ Учредители: Бухарский государственный медицинский институт, ООО" Новый день в медицине", (3), 392-397.

18. Бобожанов, У. А., & Киличев, И. А. (2018). Факторы риска спинальных аномалий у детей. Национальный журнал неврологии, (1), 50-53.

19. Бобожанов, У. А., & Киличев, И. А. (2019). STRUCTURE OF EPILEPTIC VESSELS IN CHILDREN RESIDING IN THE AREAL REGION AREA. Новый день в медицине, (3), 70-72.

20. Бобожанов, У. А., & Киличев, И. А. (2019). Структура эпилептических судорог у детей проживающих в зоне Приаралья. Тиббиётда янги кун. Илмий реферативь, маърифий-маъновий журнал, (3 (27)), 70.

21. Бобожанов, У., & Садикова, Г. (2021). Болаларда эпилепсиянинг келиб чиқиш сабаллари, ҳавф омиллари ва кечиши. Неврология, 1(2), 49-51.

22. Садикова, Г. К., Таджиев, М. М., & Бобожанов, У. А. (2017). Анализ факторов риска спинальных аномалий у детей. Молодой ученый, (12), 151-153.