ISSN: 3060-4737 Volume 2, Issue 11 IF(Impact Factor) 10.98 / 2025

EVALUATING THE MECHANISM OF THE EFFECTS OF PESTICIDES ON THE HUMAN BODY

Faiziboev Pirmamat Normamatovich
Head of the Department of Hygiene,
Doctor of Medical Sciences, Associate Professor
Samarkand, Uzbekistan
Kurbanov Shakhboz Shukhratovich
Second-year Master's student, Department of Hygiene
Toshboev Akmal Tangir ogli
Karshiboev Zakariyo Tolmas ogli
Nurimova Zokhira Qudrat qizi
Clinical Residents of the Department of Hygiene
(Samarkand, Uzbekistan)

Abstract: About 30% of the world's employed population consists of agricultural workers, who also have to work with toxic chemical substances such as pesticides. The use of pesticides helps prevent large-scale crop losses. According to the World Health Organization, annually between 550,000 and 2 million people suffer from the side effects of pesticide exposure. Approximately 40,000 of them die from the consequences of these exposures. Assessing the impact of pesticides used in agriculture on public health is one of the main challenges not only for humans and the environment but also for healthcare workers.

Keywords: Side effects of pesticides, poisoning, agriculture, mechanism of action, metabolic changes.

Аннотация: Около 30% занятого населения мира составляют работники сельского хозяйства, и им также приходится работать с токсичными химическими веществами, такими как пестициды. Использование пестицидов помогает предотвратить потерю урожая в больших количествах. По данным Всемирной организации здравоохранения, ежегодно от побочного воздействия пестицидов страдают от 550 тысяч до 2 миллионов человек. Около 40 тысяч из них умирают от последствий этих воздействий. Оценка влияния применяемых в сельском хозяйстве пестицидов на здоровье населения является одной из основных проблем не только для человека и окружающей среды, но и для работников системы здравоохранения.

ISSN: 3060-4737 Volume 2, Issue 11 IF(Impact Factor) 10.98 / 2025

Ключевые слова: Побочные эффекты пестицидов, отравление, сельское хозяйство, механизм воздействия, метаболические изменения.

Relevance of the topic: It should be noted that in international treaties aimed at banning or restricting the persistent production and use of organic pollutants, the toxicity of pesticides depends on their purpose and other factors. Worldwide, more than 1,000 types of pesticides are used to protect food products from damage or destruction by pests. Each pesticide has its own specific characteristics and toxicological properties. According to forecasts by the United Nations Department of Economic and Social Affairs, the world population is expected to reach 9.7 billion by 2050, which is more than 30% higher than the figure in 2017. Almost all of this demographic growth will occur in developing countries. According to calculations by the Food and Agriculture Organization of the United Nations (FAO), with such population growth in developing countries, food production will need to increase by 80%, which will be achieved through higher yields and multiple cropping on the same land area, while expansion of land for food production will only account for about 20% of the growth. In this regard, the use of pesticides helps to prevent significant crop losses.

Objective: To study the mechanism of pesticide effects on the body, the quantitative levels of harmful chemical and physical factors at main workplaces, as well as to assess their impact on the health of individuals working with pesticides.

Research Materials: To assess the mechanism of pesticide effects, as well as to develop pathogenetic prevention and treatment measures, blood, serum, bile, urine, and laboratory animals were used.

Research Results: N. E. Krishcheva, based on scientific observations of toxic effects during acute intoxication with bancol insecticide in 300 experimental animals, proved the selective accumulation of the substance in the liver, stomach, and intestines of warm-blooded animals.

M. V. Koroleva, analyzing 410 medical documents and 360 clinical cases, concluded that the development of toxic liver damage is accompanied by the balance between regulatory and cytotoxic subpopulations of T-lymphocytes. Specifically, CD4 changed by 17.9%, 19.7%, and 18.8%; CD16 by 34.0%, 38.9%, and 32.2%; in toxic hepatitis, the decrease of CD3 was 14.9%, immunoregulatory index was 41.1%, 40.1%, and 39.3%; CD8 increased by 39.7%, 33.9%, and 34.5%; alcoholic hepatitis showed an increase of 14.8%, drug-induced hepatitis 13.4%. The cytokine synthesis index

ISSN: 3060-4737 Volume 2, Issue 11 IF(Impact Factor) 10.98 / 2025

increased correspondingly: IL-4 by 15.9, 9.2, and 2.6 times; IL-6 by 11.3, 6.2, and 2.6 times; and TNF-α by 11.38, 4.9, and 3.1 times.

T. B. Sherbakov, during the development of the applied model, observed strong accumulation (accumulation index 2.55) when 0.5 LD50 dose was administered intragastrically three times, resulting in stable neuropathy due to inhibition of cholinesterase activity in the brain, liver, and blood for 21 days, emphasizing that this is one of the main visual signs of intoxication. Most scientists working in this area, based on their scientific research, believe that pesticide concentration at a natural level (mixture 1) does not cause changes in the biochemical indicators of fish. However, high pesticide concentration (mixture 2) leads to increased lipid peroxidation (LPO) and weakening of protective and detoxification mechanisms of the body, as they have also noted.

It should be emphasized that only morphological changes cannot fully explain the pathogenesis of toxic liver damage. These changes are based on metabolic processes and their shifts, which ultimately lead to disruption of morphological and structural changes in hepatocytes.

According to the conducted research, the progression of liver damage to a chronic stage may depend on two main factors: first, the toxicity strength and the extent of spread during the acute stage; second, the organism's reactivity and the liver’s ability to regenerate.

Currently, various biologically active substances are used to prevent and treat poisoning with harmful chemicals, which do not cause harm to the body over a long period.

Conclusion: The use of pesticides in the production of food products, both for domestic consumption and for export, must be carried out in accordance with the principles of good agricultural practice, regardless of the country’s economic situation. Farmers should minimize the amount of pesticides used to protect crops. In cooperation with WHO and FAO, it is necessary to assess the health risks both from direct exposure to pesticides and from their presence in residual concentrations in food products, as well as to develop recommendations for protective measures against these effects. In some cases, the possibility of producing food without the use of pesticides should be widely promoted.

References:

1. Файзибоев, П. Н. "Уткир респиратор касалликларининголдиниолишда, согломовкатланишваиммунитетнингурни." *international journal of recently scientific researcher's theory* 2.3 (2024): 13-18.

ISSN: 3060-4737 Volume 2, Issue 11 IF(Impact Factor) 10.98 / 2025
2. Файзибоев, П. Н. "САБЗАВОТ ВА ПОЛИЗ МАДСУЛОТЛАРИНИНГ ХАВФСИЗЛИК МЕЗОНЛАРИ ВА ОЗУКАВИЙ КИЙМАТЛИЛИГИНИ ГИГИЕНИК БАДОЛАШ." *INTERNATIONAL JOURNAL OF RECENTLY SCIENTIFIC RESEARCHER'S THEORY* 2.1 (2024): 136-141.
3. Файзибоев, П. Н. "АҲОЛИНИНГ ТЎҒРИ ОВҚАТЛАНИШИДА МАҲСУЛОТЛАРНИНГ БИОЛОГИК ҚИЙМАТИНИНГ ТУТГАН ЎРНИ." *international journal of recently scientific researcher's theory* 1.7 (2023): 215-220.
4. Файзибоев, П. Н. "И др. Сабзавот ва полиз маҳсулотларини сақлаш ва ташишда нозик назорат нуқталардаги хавфли омилларни баҳолаш." *international journal of recently scientific researcher's theory* 2 (2024): 3.
5. Файзибоев, П. Н. "И др. Гигиеническая оценка критериев безопасности и пищевой ценности плодоовощной продукции." *international journal of recently scientific researcher's theory* 2 (2024): 1.
6. Normamatovich, F. P., et al. "Rationale for the application of the HACCP system in the production of functional food products." *European Journal of Molecular & Clinical Medicine* 8.3 (2021): 1535-1539.
7. Normamatovich, Faiziboev Pirmamat, et al. "Estimates of consumption of confectionery products in the average daily diets of the population in the summerautumn season." *International journal of recently scientific researcher's theory* 2.1 (2024): 142-149.
8. Normamatovich, Faiziboev Pirmamat, et al. "Estimates of consumption of confectionery products in the average daily diets of the population in the summerautumn season." *International journal of recently scientific researcher's theory* 2.1 (2024): 142-149.