FUNCTIONAL STATE OF THE IMMUNE SYSTEM OF CHILDREN UNDER THE INFLUENCE OF ABIOTIC FACTORS

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Аннотация. *В данной статье описывается реакция иммунной системы детей на абиотические факторы и экопатогены. Иммунная система контролирует гомеостатический равновесия. Предупреждает органы и ткани о различных опасностях и защищает клетки от повреждений. Объединяет клетки против воздействия различных инфекций. Восстанавливает связи с теми, которые служат выживанию организма.*

В процессе адаптации детей к окружающей среде после рождения иммунная система рассматривается как структура, регулирующая врожденные естественные адаптивные защиты, независимые от самого живого организма.

Ключевые слова: *Абиотические и биотические факторы, экопатогены, адаптив, иммунитет, клетка, антитело, лимфа, лаборатория, биоиндикация, биотест, анализ, селезенка, темус, фильтр, комплемент.*

Abstract. *This article describes the reaction of the immune system of children to abiotic factors and ecopathogens. The immune system controls homeostatic balance. Warns organs and tissues of various dangers and protects cells from damage. Unites cells against the effects of various infections. Restores connections with those that serve the survival of the organism.*

In the process of adaptation of children to the environment after birth, the immune system is considered as a structure that regulates innate natural adaptive defenses independent of the living organism itself.

Keywords: *Abiotic and biotic factors, biotic factors, ecopathogens, adaptive, immunity, cells, antibody, lymph, laboratory, bioindication, biotest, analysis, spleen, temus, filter, complement*.

In general, the immune system is a structure that prevents living organs and tissues from the negative impact of external factors. It is the basis for the survival of the entire organism in dangerous conditions. It stimulates organs and tissues to fight foreign elements for their healthy development. It ensures the strength of all cells.

The immune system controls the homeostatic balance of a living organism to maintain innate immunity. The main function of leukocytes is to provide reliable protection. They also coordinate and distribute the tasks of cells that resist pathogen attacks. The function of antibodies is to establish contact with the body's tissues and warn them of exposure. This allows the body's natural defense system to function optimally. These properties of antibodies help the body fight the effects of abiotic factors.

Cytokines tell cells where to move and what to do. They also regulate possible pathological conditions. The complement system looks for healing pathways that allow the tissues of damaged organs to survive. Lymph nodes perform a unique function in the body, such as filtration. They filter out waste, toxins, and perform other important functions. The spleen, in addition to filtering blood, also renews old and damaged cells. The tonsils and adenoids perform the function of preventing various infections from entering the respiratory tract. Thymus cells help the body become independent and develop on its own.

Bone marrow produces white blood cells that support the immune system, protecting it from infections, insecticides, and other factors. The skin acts as a protective barrier for internal organs and tissues. At the same time, it stores fats necessary for a healthy environment and selectively produces cells that respond to

external stimuli. The mucous membrane, in turn, is responsible for trapping harmful substances that penetrate inside.

Therefore, the immune system is considered as a structure that regulates innate natural defenses independently of the living organism itself.

After birth, the child's body tries to adapt to new conditions. The development of the immune system is of great importance in this. For a child's healthy life, adaptive adaptation to the external environment is necessary. This is expressed in the development of the child's immune system, which protects it from various influences.

The study of the fundamentals of functional disorders of the child's body in response to external threats is a pressing issue for specialists. The tension of the immune system of children is determined by the quality of healthy nature, the environment and ecology. At the same time, the role of natural and artificial environmental factors is comparable.

The current high levels of environmental pollution in children may be due to increased levels of heavy metals associated with the construction of new buildings, as well as insufficient control of industrial, agricultural and household waste. The degree of impact of geophysical and man-made factors on organs and tissues is assessed by the body's internal immune system, since the immune system, without the knowledge of the organs and tissues themselves, adapts the external and internal environment, the physiological state of the body to combat the impact of abiotic factors.

The child's immune system is very sensitive to various factors. To fully understand the role of innate immunity in children, it is necessary to study how this defense system fights ecopathogens. After all, the child's body is most sensitive to changes in nature.

Based on the latest two-year data from literature and Internet sources, it can be said that in developed regions the number of people suffering from

immunodeficiency has increased not only among children, but also among adults. The development of ecopathologies associated with the disruption of ecosystems is assessed by the entry of various infections, abiotic factors, insecticides, pesticides and heavy metals into living organisms through various routes. Ecopathology is more often observed in children with low physical activity and a healthy lifestyle. It occurs as a result of prolonged contact with abiotic factors. This indicates a correlation between environmental conditions and the level of pathological conditions.

Monitoring the quality of the environment is necessary for the formation of a healthy lifestyle. For this purpose, it is advisable to use bioindication and biotesting methods. These methods are considered the most convenient for monitoring the environment. Biotesting studies the adaptation of organisms to the environment, and biotesting studies the impact on laboratory objects.

It is necessary to study the adaptive adaptations of non-specific immunity of a young organism depending on the environment. It is necessary to study the living conditions of living organisms in problem areas and develop methods for their elimination. By substantiating changes in the immune system, it is possible to prevent the impact of environmental factors. For this purpose, it is also necessary to carry out preventive work, since recently, due to environmental influences, the number of healthy children who suffer from respiratory diseases, gastrointestinal tract diseases and other diseases is increasing every day.

Currently, this requires conducting tests to determine the immunity of a young organism, that is, a biochemical blood test, the skin's reaction to various foreign elements and other parameters. Biochemical analysis allows you to compare healthy and pathological parameters, as well as assess changes in the immune system during damage. The analysis allows you to obtain information about blood parameters.

In the course of numerous laboratory studies, for example, it was established that the parameters of the patient's oral cavity changed by 2-2.5 times compared to

healthy people. days of substances included in the composition of the microflora of the oral cavity and koji of the oral cavity.

Abiotic factors poison the healthy environment necessary for the full life of children and adults. Therefore, it is necessary to protect the environment from such negative impacts first of all. To do this, it is necessary to control the rational use of building materials in rapidly developing regions. It is necessary to find ways to reduce the concentration of abiotic factors, insecticides, pesticides, etc., used purposefully. For this, it is necessary to develop immunotoxicology, a science that studies phenomena not related to the organism itself. At the same time, it studies the functions of metabolites, antigens, etc.

Mitobolites are molecules that fight for the healthy existence of the organism, protecting organs and tissues from invasion. They transmit signals to protect against pathogens. Examples of mitobolites: Energy sources: glucose, fatty acids; Building blocks: amino acids, nucleotides; Waste: carbon dioxide, urea; Signaling molecules: hormones, neurotransmitters, etc.

The adverse effects of various pathogens weaken the immune system. As a result, organs and tissues cannot perform the functions of natural defense. In such cases, drugs are used. Organs and tissues process drugs that enter the body, breaking them down into metabolites. These metabolites contribute to the recovery and survival of the body.

In conclusion, it should be noted that it is necessary to develop measures to protect children's immune systems from ecopathogens. It is necessary to take into account world standards for the abiotic factors used. It is necessary to develop programs to improve the quality of ecosystems in contaminated areas. It is necessary to pay attention to a healthy lifestyle.

LIST OF REFERENCES

1. Алимова, З. Ф. К., & Раджабалиева, М. А. К. (2025). Atmosfera ifloslanishining respirator kasalliklar rivojlanishiga ta’siri. Epidemiologik

tahlil va profilaktika choralari. Биология и интегративная медицина, 465-473.

2. Abdurashid, O., Gulrukh, I., Gulbaxor, U., Nafisa, G., Gullola, K., Malokhat, J., ... & Dilshod, D. (2025). CD19-Targeted Lipid Nanoparticles for Delivering Venetoclax and BCL2 siRNA in B-Cell Acute Lymphoblastic Leukemia. Journal of Nanostructures, 15(2), 587-595.
3. Захарченко, М. П., Захарченко, М. М., & Захарченко, В. М. (2007). Гигиеническая диагностика абиотических изменений микробиоценоза в современных условиях. Гигиена и санитария, (6), 28-30.
4. Кобилжонова, Ш. Р., Миррахимова, М. Х., & Садуллаева, Х. А. (2022). Распространенность и факторы риска бронхиальной астмы у детей. Журнал теоретической и клинической медицины, (2), 51-56.
5. Komiljonovich, P. M., Islamovich, A. M., Urunboevna, U. G., & Alibekovna, E. K. (2015). Protective effect of salvifolin on liver mitochondrial function in rats with experimental diabetes. European science review, (7-8), 3-7.
6. Иванов, В., Иванова, Н., & Полоников, А. (2022). Медицинская экология. Litres.
7. Исаева, Р. Б. Состояние иммунной системы у детей, проживающих вразличных районах экологического неблагополучия приаралья. қаңтар-наурыз, 54.
8. Савченко, О. В. (2018). Влияние загрязнения окружающей среды тяжелыми металлами на здоровье детей дошкольного возраста. Экология человека, (3), 16-20.
9. Урманова Г.У. Фозалон инсектициди ва кадмий ионларининг жигар митохондриялари мембранаси ўтказувчанлигига Доклады Академии наук Республики Узбекистан, (2006). (6), 81.
10. Токмакова, О. Г. (2003). Изменения состояния иммунной системы детей под влиянием неблагоприятных факторов окружающей среды и

возможные пути их коррекции (Doctoral dissertation, автореф. дис.… канд. мед. наук).

11. Толстая, Е. В. (2005). Экологическая медицина. Минск: МГЭУ им. АД Сахарова.
12. Тоштемирова, М. Ж., Урманова, Г. У., & Асраров, М. И. (2002). Изучение действия инсектицида фозалона на функции митохондрий печени крыс в опытах in vivo. Известия вузов. Химико-биологические науки, (4), 28-31.
13. Урсова, Н. И. (2017). Практические подходы к оптимизации микробной экологии пищеварительного тракта у детей. Фарматека, (11), 14-21.
14. Урманова, Г. У., Каршиев, Д. А., & Исламов, Ю. Н. (2022). Аллергические изменения поджелудочной железы циррозах печени у детей. Воронцовские чтения®. Санкт-петербург-2022, 114.
15. Черешнев, В. А. (2000). Экология, иммунитет, здоровье. Известия Уральского государственного университета. 2000.№ 16.
16. Щеплягина, Л. А., & Круглова, И. В. (2009). Возрастные особенности иммунитета у детей. РМЖ, 17(23), 1564-1569.