Mythical and Real Dangers of Ecology and Health

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Abstract

This article discusses mythical and real dangerous of ecology and health. In response to it, they produce mycotoxins, this is their way of protection, like snakes. The production of mycotoxins especially increases when soils are contaminated with pesticides, as well as in dry years. In these cases, even edible mushrooms become poisonous. Therefore, in conditions of unfavorable ecology, mushrooms must be collected very carefully.

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Introduction

At present, at the intersection of physiology, immunology, and ecology, a new direction has emerged - ecological immunology (EI), which studies the functioning of the immune system in a changing environment, which changes mainly under the influence of anthropogenic factors.

The content of modern ecology is determined from the concept of levels of life organization, which make up a kind of biological spectrum. As a result of interaction with the environment at each level (community, population, organism, organ, cell, gene), corresponding functional systems arise (genetic, cellular, organ, organism systems, population and ecosystems).

The upper part of this spectrum is the subject of classical ecology. At present, the development of ecology along the path of an in-depth study of the impact of environmental factors on various functional processes of the body has led to singling out such new industries as ecobiochemistry, ecogenetics, ecoimmunology.

The Main Findings and Results

Modern ideas about the impact of environmental factors on the body, among which physical, chemical, biological, psychological and social ones can be distinguished, are presented. Based on the concept of multi-level regulation of maintaining homeostasis, we consider the action of ecogenic factors in accordance with these levels: central, systemic, intersystemic, cellular and molecular.

Taking into account that, in addition to possible radionuclide exposure, oilfield workers are constantly exposed to petroleum products and a number of other technological xenobiotics, an immunological examination was carried out for a group of workers employed in a similar industry, but who had no contact with radiation.

Firstly, these are traces of industrial pollution: the consequences of soil pollution by emissions from enterprises, thermal power plants, and vehicles. Toxic metals, gasoline, dioxins.

Secondly, this is an inevitable consequence of industrial agriculture, because today most of the agricultural products are obtained differently than a hundred years ago. Intensive farming aims to get the maximum yield per unit area. Thicker planting, more fertilizer. But plants do not live well in cramped conditions, they begin to get sick, weeds and pests begin to multiply among them. Pesticides come to the rescue: pesticides, herbicides and others. Moreover, plants get used to pesticides, like drugs. There will be no going back.

Is there an alternative? Whole two. One is real and the other is fantasy.

The real one is genetically modified (GM) plants. They were first obtained by American scientists in the 1980s. The special properties of such plants made it possible to hope that they would save humanity from starvation. For example, potatoes resistant to the Colorado potato beetle

were bred by genetic engineering methods. But if the plants are resistant to insect pests, pesticides become unnecessary. However, the promotion of such crops is limited by a wary attitude.

GM plants should be treated calmly, you need to understand that such products will never lead to mutations in the human body, this is out of the question. Other possible side effects cause concern, primarily allergies. Much of the concern stems from the fact that GM foods are new. Unlike obviously dangerous pesticides, which we are not afraid of - we are already used to it.

The second alternative to pesticides (the one from the realm of fantasy) is environmentally friendly products.

All over the world, this is the name given to elite products obtained without the use of herbicides, pesticides, etc. in areas with an environmentally friendly environment. And besides, produced without food additives and, of course, in accordance with sanitary standards. In the West, this is how they get food for very wealthy people. Today, we have separate products for children and children that meet these requirements. We call environmentally friendly any products that simply comply with sanitary standards. In other words, it only means that the products are harmless. Simply put, this is a publicity stunt. The production of truly organic products is a very expensive pleasure. It cannot be used on a mass scale.

Now let's move on to intensive animal husbandry. Farm animals in Russia spend most of the year on the farm. In close quarters, they begin to hurt, gain weight poorly. Therefore, they are stuffed with different drugs. They are given:

- Antibiotics - for prevention; and as a result, antibiotic-resistant microorganisms appear in people who eat the meat of such animals (therefore, infectious diseases are then difficult to cure);
- Growth hormones - stimulants of the type that bodybuilders use to build muscle mass;
- Sex hormones - to get more weight gain, as a result, we eat not a bull or heifer, but "something in between"; then these hormones enter the plate of the eater and - the result can be appropriate (although not as pronounced as in animals); and then there are the so-called death hormones, which are formed during the slaughter of animals.

Mycotoxins are poisons secreted by fungi. Delicious and nutritious mushrooms have two dangerous properties. First, mushrooms are natural concentrators of radionuclides and toxic metals. For example, cadmium is 10 times more concentrated in mushrooms than in potatoes, and radioactive cesium is 22,000 times more concentrated! Secondly, fungi are very sensitive to environmental problems. In response to it, they produce mycotoxins, this is their way of protection, like snakes. The production of mycotoxins especially increases when soils are contaminated with pesticides, as well as in dry years. In these cases, even edible mushrooms become poisonous. Therefore, in conditions of unfavorable ecology, mushrooms must be collected very carefully. Never pick mushrooms closer than 150 m from the freeway! And in dry years it is better to refuse to pick mushrooms altogether - health and life are more expensive.

Even more dangerous are microscopic fungi - mold. They are able to secrete especially dangerous poisons - aflatoxins. Only 0.5 mg of aflatoxins per 1 kg of product infected with a fungus can disrupt the immune system and lead to oncological diseases. Especially often aflatoxins are formed on stale legumes and in peanuts. In general, any moldy products should be thrown away immediately. And the whole thing: the whole loaf of bread, the whole jar of jam. It's a pity, but what to do: after all, the threads of the mycelium permeate the entire product, and the mold on the surface is only a visible part.

The recommendations are very simple: be picky, eat varied and wisely. Yes, up to 80% of fish and fish products are contaminated with nitrosamines. But this only means the danger of daily consumption of such fish. So, let's not eat exclusively fish. We will alternate it with meat, poultry. And if we buy fish, then we will choose a smaller size: young fish do not have time to accumulate toxic substances dissolved in water.

Thus, it seems that when analyzing age dynamics, we are faced with the manifestation of a variant of an adaptive reaction to the impact of a complex of anthropogenic factors. For individual parameters, a wave-like change is recorded: the stimulation phase alternates with subsequent oppression. This clearly demonstrates the plasticity of the compensatory capabilities of the immune system of a growing organism, which must be taken into account when vaccinating.

Simultaneously with studies on adults working in production, on children living in unfavorable industrial and favorable regions, a full-scale experiment with laboratory animals was carried out in the same regions.

In the dynamics of observations (up to 120 days), the immune status, parameters of the monooxygenase system of the liver were assessed, cytogenetic analysis of the bone marrow, analysis of mutations in the germ cells of male rats were performed. The studies found that the level of chromosomal aberrations in the bone marrow of rats and mice gradually increased during their exposure to the sites of industrial enterprises and the residential area of the city. The frequency of aberrations per 100 metaphases exceeded the level of disturbances in the control (exposure in an area favorable for living) by 2–2.5 times. In the same groups of animals, changes in the state of the liver monooxygenase system and a pronounced suppression of the humoral immune response, as well as the effects of the formation of genetic disorders in the generative cells of male rats, were revealed.

The overall result of clinical and experimental studies leads to the following conclusion: anthropogenic factors affect the

functioning of the immune system and can lead to the development of an environmentally determined secondary immunodeficiency state (EDSIDS). It is obvious, in our opinion, that the time has come to move from episodic studies to continuous monitoring of the state and function of the immune system of people exposed to long-term exposure to environmentally harmful factors.

Options for implementing environmental impacts on the immune system are given. The result of ecogenic influences is the adaptation of the immune system or its dysfunction. Adaptation options: the first - there are no deviations in the immunogram, there are no clinical manifestations; the second - deviations in the immunogram are established, there are no clinical manifestations (this, in our opinion, is just the option that is often included in the norm and determines its variation and "blurring").

We believe that in conditions of ecological trouble, depending on the state of adaptation or failure of adaptation mechanisms, it is necessary to take measures aimed at leveling the ecogenic impact on the immune system. One of the important advantages of ecological immunology in comparison with other disciplines of clinical immunology is not so much in fixing the fact of trouble, but in the real possibilities of immunocorrective therapy, which is largely capable of leveling environmental impact on the body. Depending on the situation, this can be immunoprophylaxis, immunorehabilitation or immunotherapy. From our point of view, this is where the concepts of "environmental" and "clinical" immunology merge.

Physical, chemical and biological changes in the external environment primarily affect a living organism, and, therefore, human health. In other words, these changes affect the ability to work, life activity, as well as the life expectancy of a person. The main solution to the environmental problem is the proper organization of industrial and non-productive human activities, as a result of which environmental damage to the environment and harm to human health will not be caused. One of the objective reasons for such attention to the problem of environmental protection is changes in industrial production that occur due to the involvement of many natural elements and new synthetic compounds in human economic activity, which significantly changes the qualitative and quantitative characteristics of the state of the environment due to its pollution.

The purpose of the work: to study the influence of environmental and production environment factors on the state of health of the population of the Republic of Uzbekistan and the development of comprehensive measures to reduce the negative impact of these factors on the human body.

Research results. Harmful waste released into the atmosphere from an aluminum plant in Tajikistan causes a serious environmental situation in the nearby areas of Sariosiyo, Uzun va Denov, Surkhandarya region of the neighboring state, i.e. Uzbekistan. According to the latest information, the harmful compound hydrogen fluoride emitted by an aluminum plant in the Surkhandarya region exceeds the MPC by 2.5 times. As a result, the level of diseases increases sharply. For example, among women there is a tendency to increase such diseases as anemia - 68.7%, endemic goiter - 3.6%, gastrointestinal diseases - 5.5%.

In modern conditions, the development of industrial enterprises follows the path of creating large industrial complexes, which, as a rule, include various large-tonnage production facilities. Such large industrial complexes include Almalyk, Akhangaran, Angren, Navoiy, Chirchik, Bekabad industrial complexes. But, noting the positive aspects of industrial complexes, it is necessary to state the fact that they are large sources of multi-component gas-vapor-dust pollution of atmospheric air.

When studying the state of atmospheric air pollution in cities where large non-ferrous metallurgy enterprises are located at stationary posts and waypoints, the heads of the Hydrometeorological Service conduct constant observations, and conduct a chemical analysis of sulfur dioxide, nitrogen dioxide, carbon monoxide, ammonia, ozone, the content of dust, hydrogen fluoride, phenol, and only in some cases, episodic determination of metals. This does not take into account the most dangerous and highly toxic substances such as lead, mercury, as well as chromium, arsenic, zinc, cobalt, cadmium, does not take into account the content of 3-4 benzopyrene and other substances.

According to the hydrometeorological center in the cities of Olmalyk, Fergana, Navoiy, Kokand and Tashkent, air pollution is observed with various types of harmful compounds with an increased MPC. It is established that in Uzbekistan for 2002-2004. Waste emissions of industrial enterprises into the atmosphere amounted to 33%. Of these, the following ingredients accounted for the most part: carbohydrates - 21.9%, sulfur oxide - 41.2%, nitric oxide - 9.1%, solids - 16.5%.

According to the criterion of the ratio of the sum of concentrations in relation to the MPC, it showed that the concentration of lead, mercury, zinc, copper and arsenic does not exceed one and is 0.4, which is regarded as non-hazardous. The actual load of the HCCH preparation is 0.0008 mg/kg, and for DDT and its metabolites in milk and dairy products it is 0.077±0.0045 mg/kg, the average daily dose is 0.0001 mg/kg. The hygienic assessment according to the criterion of the total load is 5.8, which is regarded as potentially dangerous. The data obtained allow us to take urgent measures to reduce the territorial load of HCH in the Ferghana Valley.

The morbidity of pupils according to the 3-year visitability amounted to Tashkent 288 per 100 patients, Margilan 585 per 100, Andijan 258 per 100 and Namangan 459 per 100 patients. The data presented in tables 1-4 show that the highest incidence of both boys and girls is at the age of seven. It decreases with age. The lowest incidence rate is

observed at the age of 15-17 years.

An analysis of the morbidity structure of pupils from the orphanage in Tashkent by disease class shows that the highest prevalence of diseases of the endocrine system, eating disorders and metabolic disorders is 18.67%, which are caused by diseases of the endocrine system (enlargement of the thyroid gland, malnutrition, general retardation of physical development and etc.) On the 2nd place of respiratory diseases - 13.57%, which are formed due to acute respiratory viral infections, tonsillitis and acute bronchitis. On the 3rd place are diseases of the blood, hematopoietic organs (of the total number of blood diseases - iron deficiency anemia was the most common) - 12.5%, and the genitourinary system - 12.5%, which occupied the fourth place. Infectious and parasitic diseases took the 5th place - 6.47%, in the structure of infectious and parasitic diseases, children had the largest share.

On the 6th place are injuries and poisonings, which increased with increasing age. Diseases of the nervous system occupied the following place - 3.88%. It should be noted that the prevalence of diseases of the nervous system, including neurosis, neurocirculatory dystonia in pupils becomes much higher with age. This is due to the fact that the health status of this contingent of children is greatly influenced by various psycho-emotional and genetic risk factors: an unhealthy microclimate in the former or current family, the absence of one or both parents, psychogenic trauma, parental alcohol abuse.

Other types of pathology - diseases of the skin and subcutaneous tissue, anomalies of the musculoskeletal system - accounted for 3%. At the same time, dental caries, myopia, and obesity were recorded much less frequently.

In 2000-2010 tuberculosis incidence rates were studied in the Republic of Uzbekistan and the Ferghana Valley. In Ferghana region, the incidence rate was 50.6 in 2000 (in the Republic - 64.5), in 2001 - 60.0 (in the Republic - 72.4), in 2003 70.0 (in the Republic – 77.1). The highest incidence of tuberculosis in Fergana region in 2010 amounted to 67.4 (in the Republic - 73.5), i.e. If we compare 2000 and 2010, we can see that over 10 years the incidence rate has increased by 16.8.

Due to the unfavorable housing situation, tuberculosis was: among the population - 62%, in boarding schools - 56%, in reception centers - 70%, among orphans - 67%, among migrants 65%. In connection with alcoholism, tuberculosis was: among the population - 61%, in boarding schools - 9%, receivers - 14%, among orphans - 71%, among migrants - 43%. In connection with tobacco smoking, tuberculosis was: among the population - 61%, in boarding schools - 67%, receivers - 71%, among orphans - 64%, among migrants - 78%. Due to environmental factors, tuberculosis was: among the population - 24%, in boarding schools - 45%, receivers - 42%, among orphans - 38%, among migrants - 35%. In connection with the state of nutrition, tuberculosis amounted to: among the population - 65%, in boarding schools - 64%, receivers - 62%, among orphans - 65%, among migrants - 34%. Due to unknown etiology, tuberculosis was: among the population - 28%, in boarding schools - 31%, receivers - 31%, among orphans - 25%, among migrants 21%, among the homeless - 34%.

In the second half of the 20th century, the problem of environmental pollution became especially acute for the northern peoples, who lived in harmony with the outside world for thousands of years. These peoples, often living in harsh conditions, were able to develop their culture without destroying their habitats. Stormy invasion of the world of northerners by the achievements of modern science and technology, along with an increase in the quality of life, has led to a violation of the fragile nature of the North. And as a result - to a negative change in the main indicators characterizing the state of human health.

Human health is not limited to physical health. The reason for the deterioration of health can be negative factors of the social environment, personally significant situations, stress to which the human psyche reacts. Human ecology (as a scientific discipline), according to V.P. Kaznacheev, being a part of social ecology, studies the patterns of human interaction with the environment, the preservation of his health and the development of mental capabilities.

The World Health Organization (WHO) proposed that human health be considered in three components: physical (somatic), mental and social. Let’s look at the last two.

In medicine and in psychology, there are different approaches to the problem of mental health. The traditional medical (psychiatric) model considers mental health as a measure of the likelihood of developing mental illness (a “negative” definition of health as the absence of illness). Here, health is viewed from the standpoint of mental disorders and personality anomalies as deviations from the norm. It is believed that mental health cannot be reduced to the comfort of well-being (a state of mind, well-being), considered by clinicians as a subjective self-assessment. It should be noted that the concept of “norm” used in the medical model cannot be a full-fledged criterion, mental health already because all norms are a consequence of the culture and traditions of a certain society, characteristic of a certain historical period. A person who deviates significantly from the standards of his community runs the risk of being recognized mentally.

Psychologists usually cite the following as the main criteria for mental health:

1. The correspondence of subjectively reflected images to the objects of reality and the nature of the reaction - to external stimuli, as well as the meaning of life events.
2. An age-appropriate level of maturity of the emotional-volitional and cognitive spheres of the personality.
3. Adaptability in microsocial relations (with the immediate environment of a person - in the family, with relatives, friends, colleagues).

4. The ability to self-manage behavior, reasonable planning of life goals and maintaining activity in achieving them, etc.

Note that the listed characteristics are more indicative of the degree of perfection and maturity of the individual, rather than mental health. In addition, the lists of features that are characteristic of the positive health model do not allow answering the practical question of the mechanisms for maintaining and restoring mental health when it is impaired.

One can notice the semantic proximity of the psychological criteria of mental and social health: in fact, in both cases, the psychological characteristics of a full-fledged, healthy personality are given.

Criteria of psychological health are given:

1. The ability to self-regulation (internal and external).
2. The presence of a positive image of "I" and "Other".
3. Possession of reflection.
4. The need for self-development.

In our understanding, personality ecology (as a scientific direction) should be focused on studying the patterns and possibilities of preserving the health of the individual in a social and informational environment, creating conditions for the full disclosure of the potential forces and capabilities of the individual, restoring the disturbed balance in the human soul. At the same time, the information environment of society (Information environment) is understood as the world information around a person (including the media and the Internet), and the world of his information activities. The information environment also includes a set of socio-economic and cultural conditions for the implementation of informatization processes.

Hygiene is the main preventive medical discipline focused on maintaining and strengthening the health of the population. Accordingly, personal hygiene can be considered as a branch of hygienic science that studies the influence of social environment factors on a person in order to optimize favorable and prevent adverse effects.

Personal hygiene focuses on two objects of study - environmental factors (social and informational) and the reaction of the individual. In this case, one should use the knowledge, methodology and methods of psychological science and its branches (general, social, personality psychology, labor psychology).

In the process of labor activity, a person manifests one more of his social and psychological essence: he appears as a subject of labor (in the general case) or a subject of professional activity (in a particular case). And here appear the psychological aspects of labor ecology and occupational health, associated with the study of the impact of the production (labor) environment and factors (operational, cognitive, socio-psychological) of the production process on the individual, including the problems of psychological support for professional activity.

Working capacity is considered as a criterion of professional health. The structure of professional performance, according to researchers, consists of three groups of factors: physical (somatic) status, mental (psychiatric) status and socio-psychological characteristics personality. Thus, mental status and personal characteristics are essential components of occupational health.

CONCLUSION

It seems relevant to us to consider the socio-psychological aspect of the problem of professional health, in particular, mental and social health as indicators of personal health.

A positive approach fully approaches the assessment of personal health. Personal health criteria include:

a) The degree of adaptation of the individual in society.
b) Satisfaction with the quality of life, subjective well-being, etc.
c) The ability of a person to perform social functions (inclusion of a person in a variety of social structures).

Such an approach to health has a number of consequences that are important for practice:

1) The relativity of health, which implies the absence of "absolute" mental health.

This means that there is no person who could maintain mental health in any social roles or situations.

2) Limited approach to the socio-cultural norms of society or social group.
3) A functional understanding of health does not imply the complete absence of symptoms of a mental disorder, but only states that such symptoms, if present, do not cause social or behavioral dysfunction.

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