Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 2, 2021, Pages. 3061 - 3065
Received 20 January 2021; Accepted 08 February 2021.

To the Question of Studying the Role of Anthropogenic Factors in the Complex Environmental Impact on Population Health in the South Priaralie

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Abstract: the article presents studies of the state of health of the population and the study of the role of anthropogenic factors in the complex influence of the environment on the health of the population in the southern Aral Sea region in connection with the influence of various factors. It has been proven that pollution of the environment and living conditions adversely affects the health of the population. The result of the impact of environmental factors of various nature (chemical, physical, biological) and nature (social, economic, natural) is an increase in mortality, morbidity, deterioration in physical development and an increase in the number of people with predominant conditions. In this region, the influence of a number of unfavorable factors on the human body was noted: a shortage of drinking water, high (up to 4 times) its mineralization, an increase (up to 1.5-2 times) in the content of chlorides, sulfates and hardness in it, high insolation, unbalanced nutrition of the population and other factors. The presence of environmental discomfort contributes to the unfavorable course of diseases of the kidneys and urinary tract, their frequent recurrence, chronicity and the development of life-threatening complications.

Keywords: Southern Aral Sea region, environmental factors, population health, pollution, morbidity, mineralization, shortage of drinking water.

Introduction

Environmental protection in the interests of preserving human health, in particular, reducing the negative consequences of exposure to harmful factors, remains a fundamental task of medical and biological research. At the same time, the main way of forming strategic directions for environmental safety and their implementation at the present stage is the assessment of risks and the development of management decisions to optimize the environment, living conditions and health status of the population [1, p. 129-130].

Numerous studies of the state of health of the population in connection with the influence of various factors, which were carried out in our country and abroad, have convincingly proved

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that pollution of the environment and living conditions adversely affects the health of the population. The result of the impact of environmental factors of various nature (chemical, physical, biological) and nature (social, economic, natural) is an increase in mortality, morbidity, deterioration in physical development and an increase in the number of people with premorbid conditions.

Characterizing the role of individual factors in the formation of the morbidity of the population, domestic and foreign researchers confirm that each subsequent doubling of environmental pollution causes an increase in morbidity by a certain percentage [2, p. 3-10].

Place and results of research

Anthropogenic pollution of the environment has a pronounced impact on the formation of population health, especially in connection with changes in socio-economic conditions. Therefore, the problem of the unfavorable influence of environmental factors on the state of health is becoming increasingly important every year.

Determination of quantitative relationships in the "environment - health" system as a primary task of environmental hygiene was first posed by G.I. Sidorenko in the late 60s - early 70s and later was developed in the development of criteria and methods for quantitative assessment of the impact of environmental factors.

As you know, morbidity is the most characteristic, officially registered reaction to the harmful effects of the environment, which reflects both long-term and chronic effects of a pollutant [3, p. 160]. Environmental factors act on various nosological forms and groups of diseases. Studies show that the overall contribution of anthropogenic factors to the formation of health deviations is from 10 to 57% [4, p. 3-5]. Such widespread in cities atmospheric pollutants as sulfur dioxide, carbon monoxide significantly affect the prevalence of chronic nonspecific respiratory diseases, ARVI, allergic diseases, endocrine system diseases, nutritional and metabolic disorders, diseases of the nervous system, and digestive organs.

Numerous studies show the relationship between socio-hygienic and environmental factors and indicators of the health status of the population. The selectivity of the influence of factors on specific groups and forms of diseases is consistent not only with general biological concepts, but also with the available data on the pathophysiological characteristics of the impact of various environmental factors on the body. Assessment of the significance of environmental pollution by the biological responses of the human body, in terms of health indicators is more objective than comparing the concentrations of individual pollutants with hygienic standards, because integrally takes into account the influence of all, including unidentified, pollutants, their complex and combined effect on the human body [5, p. 160].

One of the most thoroughly studied environmental factors is atmospheric pollution. The

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ubiquitous air pollutants are carbon monoxide, sulfur dioxide, nitrogen oxides and suspended solids.

So, according to researchers, low concentrations of carbon monoxide cause chronic intoxication, characterized by pronounced polymorphism: a tendency to angiospasms, damage to the nervous and cardiovascular systems, asthenia, hemodynamic and visual disturbances, skin lesions, etc. [6, p. 36-38]. According to V.Z. Martynyuk et al. (1969), carbon monoxide as a histiogenic factor causing primary damage to cellular respiratory systems is neurotropic. The shifts caused by it can be potentiated by changes in the vessels. In this case, neurohumoral regulation is disrupted. As a result of prolonged exposure to even subtoxic doses of carbon monoxide in the body, its connection is formed directly with enzymatic or other constituent parts of cells, which is extremely slowly amenable to dissociative transformations [7, p. 328].

According to experts, small concentrations of carbon monoxide have a goitrogenic effect, the mechanism of which is due to hypoxia, as well as the possibility of a direct effect of this substance on the oxidative enzymes of the thyroid gland [8, p.47-49].

Nitric oxides are blood poisons that convert oxyhemoglobin into methemoglobin and act on the central nervous system. In addition, nitrates and nitrites are formed in the blood during nitric oxide poisoning, which act on the arteries, causing vasodilation and lowering blood pressure [9, p.12-14].

Sulfur dioxide, when inhaled, irritates the airways, leading to bronchospasm and increased airway resistance. The general effect of sulfur dioxide is to disrupt carbohydrate and protein metabolism, inhibition of oxidative processes in the brain, liver, spleen, muscles, inhibition of oxidative deamination of amino acids and oxidation of pyruvic acid [10, p.15-17].

According to the researchers, with the combined action of low concentrations of carbon monoxide and sulfur dioxide, the function of the nervous system changes, immunological reactivity decreases, and carboxyhemoglobin appears in the blood. Various chemical compounds damage the membranes of subcellular organelles, which leads to functional inferiority of cells and a decrease in the resistance of the organism as a whole.

The most widespread pesticides in the environment are still organochlorine (OC) and organophosphorus (OPC) compounds. The authors note that in the mechanism of the effect of OPC on biological structures is a violation of the catalytic function of the enzyme cholinesterase, which plays an important physiological role [75, p.36-38].

In the action of organophosphate pesticides (OPP), which have anticholinesterase activity and cause cholinergic manifestations of intoxication, it has a non-cholinergic component. The hypertensive effect of FOPs may be associated with their effect on the central nervous system and sympathetic ganglia and, possibly, partially with a reflex action through the carotid reflexogenic

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zone. COS have a polytropic effect on the human body. At the same time, lesions of the nervous system are observed, which have the character of a diffuse process like toxic encephalomyelopolyneuritis, as well as the liver and the blood system. Also, some experts have experimentally proved that long-term intake of DDT into the body of animals and its accumulation in various tissues causes a number of physiological, biochemical, immunobiological and morphological changes in the body, affects the permeability of cell membranes

Drinking water is, first of all, human health. According to the WHO, 70% of all diseases in the world are associated with unsatisfactory drinking water quality and violation of sanitary and hygienic water supply standards. The composition and properties of water should not violate the standards for any indicator, and the concentration of harmful substances should not exceed the maximum permissible concentrations (MPC or other standards) in water bodies for household, drinking or cultural purposes.

Modern data indicate the possibility of the influence of waters with a low content of hardness salts on the cardiovascular system of humans and waters, with an increased level of mineralization on the digestive organs. The exchange of trace elements in various physiological and pathological conditions of the body is covered in the works of a number of authors.

Clean drinking water should not contain harmful microorganisms. Water is an excellent breeding ground for bacteria, many diseases are transmitted through water. Of the groups of diseases directly related to the water factor are non-communicable diseases.

Result and discussion

The resulting extreme ecological situation in the South Aral Sea region has led to the emergence of environmental, socio-economic and medical problems, the leading of which is the negative impact of environmentally unfavorable factors on the health of the population living in this region. In this region, the influence of a number of unfavorable factors on the human body was noted: a shortage of drinking water, high (up to 4 times) its mineralization, an increase (up to 1.5-2 times) in the content of chlorides, sulfates and hardness in it, high insolation, unbalanced nutrition of the population and other factors. The presence of environmental discomfort contributes to the unfavorable course of diseases of the kidneys and urinary tract, their frequent recurrence, chronicity and the development of life-threatening complications. Establishing the relationship of some diseases of the urinary tract with environmental factors expanded the understanding of risk factors and, naturally, made it possible to re-examine some aspects of the diagnosis, treatment and prevention of these diseases. Meanwhile, these issues remain insufficiently studied in the South Aral Sea region.

Numerous studies conducted in agricultural regions of Uzbekistan have shown increased levels of developmental delays, hypothyroidism, immunodeficiency, and chronic renal and

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pulmonary diseases among children living in these territories. Analyzes of breast milk and umbilical cord blood of women in Karakalpakstan revealed elevated levels of hexachlorobenzene (HCB), hexachlorocyclohexane (HCH) and other most toxic dioxins. The revealed level of dioxins in breast milk in women of Karakalpakstan was 2.5 times higher than in women living in Ukraine. Several organochlorine pesticides (DDT and its metabolites DDE) are known to cause reproductive toxicity and detrimental effects on lactation function.

Thus, summarizing the analysis of the literature on the pathophysiological features of the impact on the body of various anthropogenic environmental factors, it can be noted that each of them can selectively affect the functions of individual organs and systems of the body and have a specific effect.

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