



## MORPHOFUNCTIONAL CHANGES IN THE SPLEEN AND THYMUS AND THE RESULT OF CONSUMPTION OF UNDERGROUND WATER

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### ABSTRACT

*Any external physical, chemical and biological impacts on a living organism lead to changes in the structure and function of the organs of this organism. As a result, the organism reacts by changing clinical and laboratory indicators, including the morphology of organs, within the framework of compensatory and adaptive mechanisms. Among external impacts, one of the most common in our time is drinking water of various compositions. It has been proven that excessive amounts of salts, macro- and microelements, the chemical and biological composition of water have a negative impact on the organs and systems of the body.*

By their origin, groundwater is infiltration, formed as a result of precipitation, absorption of river and irrigation water; condensation, which occurs as a result of condensation of water vapor in layers of rocks; Sedimentary rocks are divided into sedimentary, formed as a result of burial of seawater during formation, and flushing, formed during cooling or release of magma from the earth's mantle. The natural outlet of groundwater to the surface is called spring (spring) and is divided into seeping and boiling (hot spring).

Groundwater is a natural solution containing almost all known chemical elements. According to mineralization (the total amount of substances dissolved in water, g/l), groundwater is divided into fresh (up to 1.0), brackish (1.0-10.0), salty (10.0-50.0) and non-aqueous (more than 50). According to temperature, groundwater is divided into cooled (up to 4°), cold (4-20°), warm (20-37°), hot (37-42°), boiling (42-100°) and very hot (over 100°) groundwater.

Groundwater is water in a liquid, solid (ice), or vapor state, located in the pore spaces of rock layers in the upper part of the earth's crust. Groundwater is part of the total water resources and is of great importance to the national economy as a source of water supply and irrigation. The melioration state of irrigated lands is determined by the state of groundwater. Groundwater is studied by the science of hydrogeology. Water can be in a gravitational or free state, bound by molecular forces and moving under the action of gravity or pressure differences.

Layers of rocks saturated with unbound water are called aquifers; they form aquifer complexes. By the nature of accumulation in aquifers, groundwater is divided into pore water



(in soft rocks), vein water (vein water) — in hard rocks, and karst (cave) water (in fissure-karst poorly soluble carbonate and gypsum rocks). By location, groundwater is classified as soil water (see Groundwater Level), seasonal water (surface water; formed due to precipitation in reservoirs in the aeration zone or seepage of irrigation water); Water is divided into groundwater (accumulating above the first impermeable layer closest to the earth's surface) and interstratal water (unconfined, confined, artesian, aquifers located between impermeable layers).

More than 150 large groundwater deposits have been identified in Central Asia. Their annually renewable exploitable reserve is more than 1,500 m<sup>3</sup>/s, the contribution of fresh water is close to 1,000 m<sup>3</sup>/s, the rest is mineralized to varying degrees (from 2-3 to 15 g/l). There are more than 40,000 used wells in Central Asia, of which about 5,000 are artesian wells with gushing water; most of them were used for crop irrigation.

Any external physical, chemical and biological impacts on a living organism lead to changes in the structure and function of the organs of this organism. As a result, the organism reacts by changing clinical and laboratory indicators, including the morphology of organs, within the framework of compensatory and adaptive mechanisms. Among external impacts, one of the most common in our time is drinking water of various compositions. It has been proven that excessive amounts of salts, macro- and microelements, the chemical and biological composition of water have a negative impact on the organs and systems of the body.

"Morphofunctional changes in the intestine as a result of groundwater consumption are a pathological condition of the body caused by exposure to doses of chemical elements and compounds that exceed maximum permissible levels." Changes in the body under the influence of drinking water with a high chemical content, including the morphological features of organs, as well as the development of therapeutic and preventive measures to reduce the impact of groundwater with a high chemical content have not lost their relevance.

Infiltration waters are common in nature, while others are very rare in their pure form. Groundwater is used for water supply of the population, industry and pastures, irrigation of lands, medicine (mineral waters), heat supply (hot water), various salts and chemical elements (iodine, boron, bromine, etc.). Groundwater causes swamping and salinization of lands. To combat this, open and closed horizontal drains and wells are dug. Groundwater was widely used in deserts. The pastures of the Karakum, Kyzylkum and Ustyurt are mainly supplied with groundwater.

Scientific research has been conducted on the clinical and laboratory aspects of the disease caused by exposure to groundwater with increased chemical content, scientific results have been obtained, including on the effect of groundwater with increased chemical content on the body in various forms, and a new approach to its treatment has been created.

Scientific studies of clinical and laboratory aspects of the disease caused by exposure to groundwater with high chemical content were conducted, and scientific results were obtained, including the effect of groundwater with high chemical content on the body in various forms and a new approach to its treatment was created (Memorial Sloan-Kettering Cancer Center in New York, USA; The Radiation Injury Treatment Network, USA; Medical Research Center, Russian Federation); morphofunctional changes in the intestine and the



pathogenetic role of the immune system were shown in the formation of this pathology (Bhabha Atomic Research Center, India; International Atomic Energy Agency, Austria; Research Institute of Radiobiology of the Armed Forces of the Ministry of Defense, USA); diagnostic indicators of the disease, their role in the prospect of formation, development and completion of the disease were assessed (European Platform for the Exchange of Radiological Data, Luxembourg; Republican Scientific and Practical Center for Radiation Medicine and Human Ecology, Belarus); Based on experimental studies, it has been proven that this depends on the occurrence, development and complications of the pathological condition in the intestine.

Types of underground water include: according to the conditions of placement, underground water is divided into ground water, seasonal water, ground water and interstratal water. Ground water is a natural solution containing almost all known chemical elements.

According to mineralization (total amount of substances dissolved in water, g/l), groundwater is divided into fresh (up to 1.0), brackish (1.0-10.0), salty (10.0-50.0) and non-aqueous (more than 50). According to temperature, groundwater is divided into cooled (up to 4°), cold (4-20°), warm (20-37°), hot (37-42°), boiling (42-100°) and very hot (over 100°). Yukori kimeviy tarkibli er osti suvlar organismga teri, oshkozon-ichak trakti, nafas y'llari orkali tushishi mumkin. Shundan s'ng qon va lymph okimi orkali organismning boshka azzo va t'kimalariga tarkaladi.

The pathogenesis of groundwater with increased chemical content is explained by the direct and indirect effects of chemicals on the body. Chemical compounds contained in water accumulate on the walls of blood vessels and in the parenchyma of all organs and are associated with their direct and indirect effects on metabolism. In this case, physical and chemical processes in the affected cells are disrupted. In this case, the permeability of the cell membrane increases or decreases.

The indirect impact of groundwater with high chemical content is explained by the formation of water radiolysis, which makes up 70-80% of the body; during water ionization, radicals with oxidizing and alkaline properties are formed. In addition, the formation of atomic hydrogen, hydroperoxyl radicals, and hydrogen peroxide is of great importance. Free oxidizing radicals enter into an enzymatic reaction, as a result of which active sulfhydryl groups are converted into inactive disulfide compounds. These biochemical processes lead to a decrease in the catalytic activity of enzyme systems, which in turn leads to a decrease in the amount of DNA and RNA in cell nuclei, which disrupts their renewal processes.

The spleen mainly fights infection and also performs the following functions:

- Hematopoiesis. During pregnancy, the fetal spleen produces all the form-forming elements of the blood. After birth, the spleen produces only lymphocytes. If a person has a severe form of blood disease (for example, myeloleukemia) or bone marrow damage, the hematopoietic properties of the spleen are completely restored.
- Storage of red blood cells. This organ stores 8% of red blood cells.
- Phagocytosis. The absorption of old or decomposed cells, as well as foreign microorganisms and protein antibodies by special cells (phagocytes) is called phagocytosis.



- Immune reactions. After swallowing these antigen cells, the spleen increases production of blood-protective cells - lymphocytes.

There may be several reasons for removing the spleen during examination:

- Certain types of blood cancer. This may be a metastasis to the spleen of Hodgkin's lymphoma and non-Hodgkin's lymphoma, chronic lymphocytic leukemia, hairy cell leukemia or a tumor of any other organ.

- Other blood diseases. These include thrombocytopenic purpura (decreased platelets) and autoimmune hemolytic anemia (increased breakdown of red blood cells), and the spleen is removed when drug treatment does not help.

- Hypersplenism. This condition is caused by excessive breakdown of platelets and other blood cells as a result of an overactive spleen.

- Splenomegaly. In this case, the spleen becomes excessively large, causing pain, compression of the stomach, and specific complaints (such as a rapid feeling of satiety). To reduce such complaints and find out the causes, the spleen is removed.

- Severe injuries. In case of severe damage to the spleen and with large blood loss, when it is impossible to stop the bleeding, the spleen is removed.

- Infection. This condition is rare; if purulent foci and echinococcal cysts are found in the spleen tissue, part or all of the spleen is removed.

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