LABORATORY DIAGNOSTICS OF AUTOIMMUNE DISEASES

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Autoimmune diseases are a broad group of pathologies that arise due to the immune system attacking the cells of its own body. In other words, in such diseases, the human immune system perceives the cells of its own body as foreign agents and produces antibodies to them, thus damaging tissues [1,2].

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According to statistics, autoimmune diseases are found in 5-7% of the population. These include rheumatoid arthritis, systemic lupus erythematosus, Crohn's disease and many others. One of the informative markers of autoimmune pathologies with connective tissue damage are antinuclear antibodies found in the blood. Antinuclear antibodies are autoantibodies directed against various components of cell nuclei. They are found in almost 98% of patients with systemic lupus erythematosus and in 20-40% of people with rheumatoid arthritis [2,5].

Another laboratory indicator found in rheumatoid arthritis is antibodies to cyclic citrullinated peptide. In addition to antinuclear antibodies, antibodies to native DNA may indicate the development of systemic lupus erythematosus. They are detected in about 90% of patients with active systemic lupus erythematosus in the absence of treatment and in 60% of patients with an inactive course of the disease. Autoimmune diseases (AD) affect up to 10% of the world's population. The reasons for the development of AZ are: violation of the body's tolerance to its own antigens (due to hereditary or acquired disorders of the immune system), as well as the entry of “barrier” antigens into the bloodstream [2,3,4].

It is known that in healthy individuals clones of autoreactive T- and B-lymphocytes are formed, the activity of which is normally suppressed. Disabling the mechanism of suppression of the functioning of such lymphocytes is also attributed to the causes of AZ. The development of AZ is promoted by: imbalance of cytokine production, disorders in the system of antigen presentation and a number of other pathologies. The high prevalence of AZ, their severe clinical course, leading to early disability or death of patients, as well as the high efficiency of treatment initiated in the early stages of AZ, necessitate the introduction of high-precision methods of early diagnosis in laboratory practice. The main objective of laboratory diagnosis of AZ is

the detection of autoantibodies to its own antigens. Autoantibodies, as a rule, are formed long before the appearance of clinical symptoms of the disease. To detect autoantibodies, immunofluorescence methods were initially used on cell cultures with subsequent visual evaluation of the result, as well as the Western blot technique. These methods are very labor-intensive, time-consuming, expensive, and do not allow obtaining accurate quantitative values, which makes them ineffective for widespread use in practice [6,7,8].

Recently, test systems based on the solid-phase immunoenzyme method have been actively developed. Their undeniable advantages are: simplicity of test performance, possibility of full automation, reduction of false-positive results due to high degree of purification of immobilized antigen, reduction of laboratory staff workload [9,10].

Determination of autoantibodies, in most laboratories, refers to “minor tests”, the number of which does not exceed 5-10 per week. In modern economic conditions, when it is necessary to use financial and labor resources as efficiently as possible, laboratories either use the first solution of the problem generates a whole range of new difficulties: it is necessary to organize the transportation of samples, their reliable labeling, long time to obtain the result. In case of outsourcing, sample loss or a sharp decrease in sample quality at the pre-analytical stage is possible [11,12,13].

A blood test for antithyroid antibodies is used to diagnose thyroid diseases such as diffuse toxic goiter and autoimmune thyroiditis. These include:

- Antibodies to thyroid peroxidase;
- Antibodies to thyroglobulin;
- Antibodies to thyroid hormone receptors [2,3].

However, it should be noted that the detection of antibodies to thyroid peroxidase and to thyroglobulin does not always indicate an autoimmune process. According to statistics, these markers are detected in about 15% of healthy people.

The diagnosis of systemic vasculitis has become much easier after the discovery of antineutrophil cytoplasmic antibodies (ANCA). Currently, two types of ANCA are distinguished - cytoplasmic (cANCA) and perinuclear (pANCA). The sensitivity of determining these markers by indirect immunofluorescence in Wegener's granulomatosis is 85%, in microscopic polyangiitis - 81% [4,5].

- In addition, the detection of pANCA in the blood may indicate rapidly progressive glomerulonephritis, or Goodpasture's syndrome. A blood test for antibodies to the basal membrane of the tubules is also used to diagnose Goodpasture's syndrome.
- Markers of autoimmune diseases from the gastrointestinal tract are:
- - Antibodies to gliadin - celiac disease;
- - Antibodies to parietal cells - atrophic gastritis;

- - Antibodies to tissue transglutaminase - celiac disease;
- - Antibodies to Saccharomyces cerevisiae - Crohn's disease [7,8].

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