ANALYSIS OF THE RESULTS OF THEDETERMINATION OF HUMORAL IMMUNE FACTORS IN ELDERLY PATIENTS WITH VARIOUS HEART DISEASES

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Abstract: To date, there is no doubt that the immune system is involved in any pathological conditions in the body, whether it is an infectious process or a purulent-inflammatory process, the immune system is involved in all. The influence of diagnosed heart defects on quantitative changes in specific and nonspecific factors of the immune system protection was determined, the imbalance in the number of immunocompetent cells in the T-shaped joint of the immune system was shown.
Keywords: acquired heart defects, humoral immunity, immunoglobulins, VEGF, TGF-b-cytokines.

Introduction. In order to have a complete picture of the immune status of the body, it was necessary to study the factors of humoral immunity, compare and analyze the results obtained. Based on the foregoing, in the patient's body there are indicators of humoral immunity - the concentration of immunoglobulins A, G, M (IgA, IgG, IgM) in the blood serum and cytokines, vascular endothelial growth factor (VEGF) and transforming growth factor-beta (TGF-beta) . b-English, transforming growth factor-b).

Material and methods. All examined patients with a diagnosis of acquired heart disease were divided into three groups: aortic heart disease (n=27), mitral heart disease (n=42) and concomitant and associated heart disease (n=51). general group of observed patients. The control group consisted of 15 healthy individuals without heart defects. Following the sequence of analysis of the obtained results, we began the interpretation with indicators of cellular immunity.

The amount of VEGF, TGF-b-cytokines and the concentration of IgA, IgG, IgM in the blood serum of patients was determined using ELISA on the Stat Fax test system (Awaress Technology, USA) manufactured by Vector Best (Novosibirsk). RF). Immunological studies were carried out at the RFA Institute of Immunology and Human Genomics on the basis of a bilateral agreement.

Statistical processing of the obtained material was carried out using the Excel program using traditional methods of variation statistics. Statistical processing of the obtained data was carried out by calculating the following indicators: arithmetic mean size (M), arithmetic mean error (m), the significance of differences was determined by the Fisher-Student test (P). Differences between the means were considered significant if the probability level was $P<0.05$. Statistical processing was performed using a software package for biomedical research on a personal computer based on Pentium IV processors. When organizing and conducting research, the principles of evidence-based medicine were used.

The results obtained and their discussion. The choice of the main classes of immunoglobulins for study is due to the fact that they play a key role in the immune response and are produced against exogenous agents and endogenous factors that enter the body. It is also involved in the elimination of antigens and self-antigens from the body.

The results obtained showed that (Table 1) the concentration of IgA in the blood serum of patients was 2.57 ± 0.15 g/l, which is up to 1.71 times higher than in healthy individuals (1.50 ± 0.1 g/l) . showed that it is reliably determined ($R<0.001$). If we take into account the high role of IgA in the immune response, one of the factors that provide local immunity, then the quantitative increase in this immunoglobulin is associated with an increase in the activity of the immune system.

Table 1

**Quantitative indicators of immunoglobulins in the blood serum of
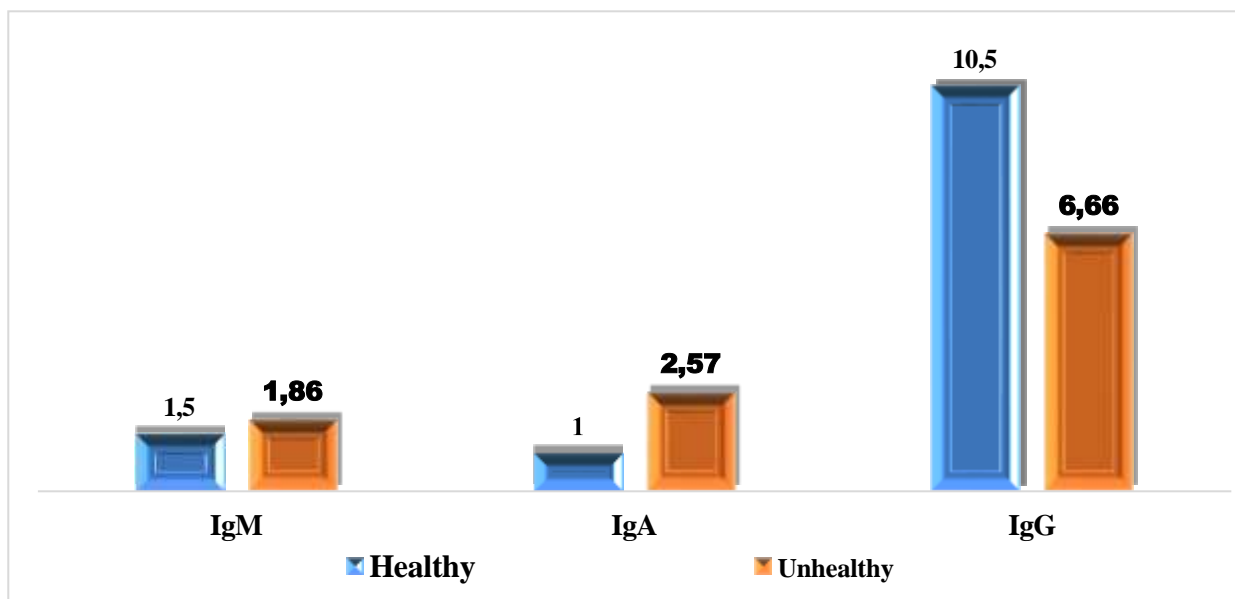patients with various heart defects, g/l**

Immunoglobulins	Healthy faces, n=15	Patients diagnosed with UN, n=40
Ig A	1.0±0.05	2.57±0.15*↑
IgM	1.50±0.10	1.86±0.10*↑
IgG	10.50±0.20	6.66±0.27*↓

Note: * - sign of technical distinction in relation to the indicators of whole persons; ↑, ↓-
direction of changes; YUN - heart defects.

A similar trend of changes was obtained for IgM, the concentration of which in blood serum was significantly increased compared to healthy individuals - 1.86±0.10 g/l versus 1.0±0.05 g/m, respectively (average 1.86 - multiple increase r<0.001).

In contrast to them, it was found that the concentration of IgG in the blood serum was significantly reduced compared to the values of healthy individuals - 6.66±0.27 g/l versus 10.50±0.20 g/l, respectively (a decrease of up to 1.58 times). , R<0.001). If we take into account that IgGs make up 75% of all immunoglobulins, provide a complete secondary immune response and form the basis of the functioning of the immune system, it becomes clear that this indicator is important. If we analyze the results of various immunoglobulins, we can see an imbalance in their number (Fig. 1).

The analysis showed that the imbalance in the amount of immunoglobulins in the blood serum of patients was determined by the ratio of the quantitative indicators of these immunoglobulins to those of healthy individuals. According to him, IgM and IgA increased by 1.24 and 2.57 times, respectively, and IgG decreased by 1.57 times (R<0.001). The quantitative increase in IgA is due to the fact that the secretory form of this immunoglobulin is always present on the surface of the mucous membranes and its functions in the blood serum. In the case of IgM, it is synthesized first when the antigen enters the body, provides a primary immune response and is of little importance in the secondary immune response. answer.

Rice. 1. The concentration of the main immunoglobulins in the blood of patients with various heart defects, g/l.

The decrease in the concentration of IgG in the blood serum compared with the indicators of healthy individuals is due to the absence of a pronounced inflammatory process in the body; as a result of the pathological process in the body, an irreversible process occurred in the heart tissue.

It should be noted that changes in these immunoglobulins in the blood serum did not have a great pathogenetic significance for these patients.

Thus, the study of the concentration of the main classes of immunoglobulins (IgA, IgM, IgG) in the blood serum of patients with various heart defects showed that there is an imbalance in their quantitative changes, if IgM increased by 1.24 times, IgA - by 2.57 times. compared with the values of healthy people (R<0.001), a statistically significant decrease in the concentration of IgG by 1.57 times (R<0.001) was revealed. This situation was explained by the absence of obvious inflammatory symptoms in patients, the strength and intensity of the secondary immune response. It has been shown that immunoglobulins in the blood serum have little pathogenetic significance in this studied pathology, and it has also been proved that the study of these immunological parameters is not mandatory in order to assess the immune status of patients, and that they have no diagnostic and prognostic value.

The lack of a study of the number of cytokines in the assessment of humoral immunity does not allow us to give a complete description of them. Therefore, the goal was to determine the cytokine status of patients with various heart defects.

To date, the cytokines VEGF and TGF-β, which are important in the pathogenesis of this disease, are actively involved in the activity of the immune system performing various tasks, and their amounts have been compared, the results are presented in Table 2.

table 2

The results of the study of the amount of cytokines in blood serum in adult patients diagnosed with various heart defects, g/l

Cytokines	Healthy faces, n=15	Patients diagnosed with UN, n=40
VEGF, g/l	92.40±1.50	368.65±2.60*↑

TGF-β, g/l	10.0±1.50	155.84±0.77*↑

Note: * - a sign of a significant difference compared with the indicators of healthy individuals; ↑-direction of changes.

The obtained results show that both studied cytokines in adult patients diagnosed with the studied pathology were statistically significantly higher than in healthy individuals (R<0.001).

If we take into account that the VEGF cytokine is produced by various cells to stimulate vasculogenesis and angiogenesis, their responsibility for restoring tissue oxygen supply (in circulatory failure), collateral circulation, then the importance of determining the amount of these cytokines becomes clear. VEGF is also responsible for pore formation and vasodilatation for chemotaxis in endothelial cells. This cytokine is important as a major angiogenic factor in heart disease.

The concentration of this cytokine in the blood serum in our case in patients was 3.99 times higher than in healthy people - 368.65±2.60 g/l versus 92.40±1.50 g/l (R<0.001). It was believed that this condition is associated with a lack of blood and oxygen to the cells of the heart and the positive effect of this cytokine on angiogenesis, in other words, it indicates a pathological condition affecting the vascular endothelium.

A similar trend of changes was observed in the co-concentration of the cytokine TGF-β, determined in the blood serum of the studied contingent, while the concentration of this cytokine was statistically significantly higher than the values of healthy individuals (R<0.001). .

The cytokine TGF-β is known to control many cell proliferation, cell differentiation, and other functions and has been shown to be involved in primary and secondary immune responses. Although their participation in cardiovascular diseases has been shown, their quantitative indicators have not been studied and analyzed in the diagnosis of heart defects. If we also take into account that they block the activity of lymphocytes and macrophages, then their influence on the activity of the immune system becomes more understandable.

In our case, it was found that the amount of TGF-β in the blood serum of patients increased by 15.58 times compared with healthy individuals - 155.84±0.77 g/l versus 10.0±1.50 g/l (p < 0.001). Although the trend of changes was similar to that for the previous studied cytokine, it turned out to be more intense (Fig. 2).
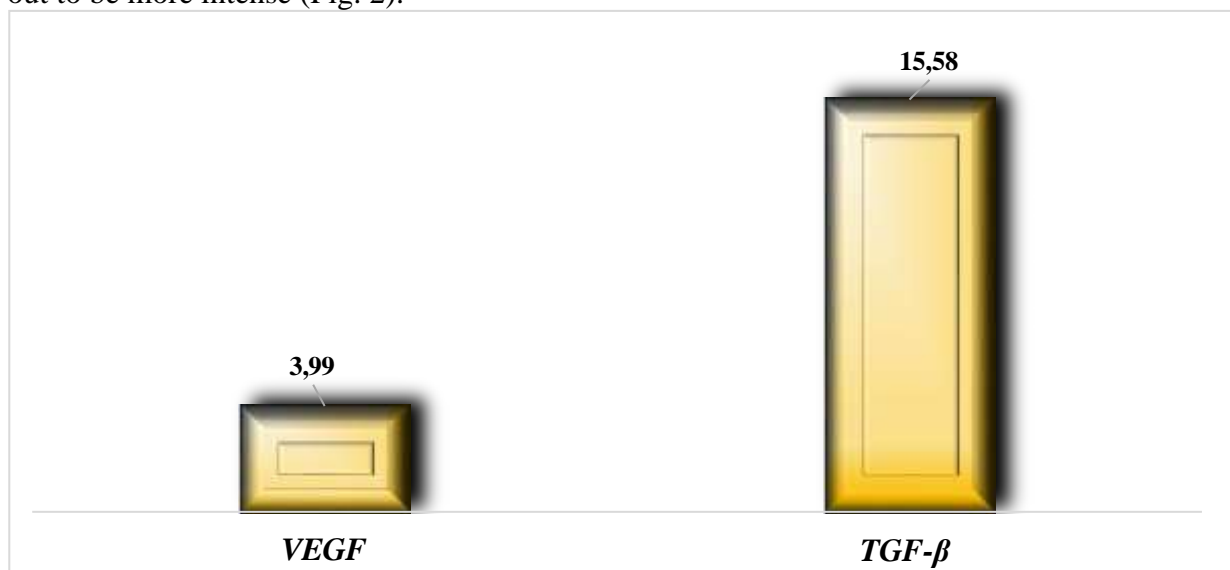
Figure 2. The ratio of VEGF and TGF-β cytokines in patients with heart failure to healthy individuals, times

The figure shows that the intensity of changes in TGF-β is higher than that of the VEGF cytokine.

Thus, a comparative study of the concentration of VEGF and TGF-β cytokines in the blood serum of patients with heart failure revealed significant changes in them. If the amount of VEGF was statistically significantly higher in patients than in healthy subjects by 3.99 times (R<0.001), then this difference in TGF-β concentration was 15.58 times (R<0.001). It can be seen that although the trend of cytokine changes was the same, their intensity was dominated by TGF-β. We believe that a sharp increase in the amount of these cytokines is pathogenetically associated with the observation of heart defects and is recommended as a diagnostic indicator of the severity of the disease in this pathology and as a prognostic immunological indicator that determines the prognosis of the disease. the end of this pathology.

Conclusions.

1. The study of the concentration of IgA, IgM, IgG in the blood serum of patients with various heart defects showed that there is an imbalance in the change in their number, if IgM increased by 1.24 times, and IgA by 2.57 times compared with healthy people (R <0.001) a statistically significant decrease in the concentration of IgG by 1.57 times (R<0.001) was found. This situation was explained by the absence of obvious inflammatory symptoms in patients, the strength and intensity of the secondary immune response.

2. The amount of VEGF in the blood serum of patients with heart defects was statistically significantly higher by 3.99 times compared with healthy people (R<0.001), and the difference in TGF-β concentration was 15.58 times (R<0.001).

3. Although the trend of cytokine changes was the same, their intensity was dominated by TGF-β. A sharp increase in the amount of these cytokines is pathogenetically associated with the observation of heart defects and was recommended as a diagnostic indicator of the severity of the disease in this pathology and as a prognostic immunological indicator that determines the prospects for the end of this pathology.

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