# IDIOPATHIC THROMBOCYTOPENIC PURPURA, QUESTIONS OF PATHOGENESIS

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**Аннотация:** Идиопатическая тромбоцитопеническая пурпура (ИТП) — геморрагический диатез, обусловленный укорочением продолжительности жизни тромбоцитов и уменьшением их количества в результате разрушения антитромбоцитарными антителами. Патогенез ИТП сложен и окончательно не расшифрован. Исследования меченных тромбоцитов показали, что у всех пациентов с ИТП продолжительность жизни тромбоцитов резко укорочена до нескольких часов вместо нормальных 7-10 дней.

**ключевые слова:** идиопатическая тромбоцитопеническая пурпура, геморрагический диатез, Т-лимфоциты

**Anotation:** Idiopathic thrombocytopenic purpura (ITP) is a hemorrhagic diathesis caused by a shortened lifespan of platelets and a decrease in their number as a result of destruction by antiplatelet antibodies. The pathogenesis of ITP is complex and not definitively deciphered. Platelet-labeled studies have shown that all patients with ITP have a sharply shortened platelet lifespan to a few hours instead of the normal 7-10 days.

**keywords:** idiopathic thrombocytopenic purpura, hemorrhagic diathesis, T-lymphocyte

The role of the spleen as a source of production of antiplatelet antibodies is confirmed by the study of the growth of MGCC colonies after the addition of plasma from ITP patients to the tissue culture. It turned out that before splenectomy, the plasma of patients does not stimulate the growth of MGCC colonies. After the removal of the spleen, the stimulating effect of the plasma of

patients on the growth of colonies, as well as the correlation of their number with the number of MGCC and platelets, was noted. Quantitative analysis of the level of antibodies to platelets and their specificity confirms the assumption that autoantibodies in ITP are not produced in relation to any single protein, but have specificity for many proteins and platelet lipids. Currently, among the numerous hypotheses of the occurrence of ITP, the most likely opinion is that the leading pathogenetic factor in most ITPs is the breakdown of immunological tolerance to one's own antigen. This means the absence of the body's immune response to a certain group of antigens. Today, ideas about immunological tolerance have changed. It has been established that antibodies are produced by B-lymphocytes and their derivatives, and T-lymphocytes perform the function of assistants, without which the response of B-cells to the antigen is impossible. Participation in the development of immunological tolerance of T- suppressors, which block the inclusion of B-lymphocytes in the process of antibody formation, has been proven. With a decrease in the number of T- suppressors B-lymphocytes can react to various antigens by producing antibodies, as a result of which an autoimmune process begins. It is also impossible to exclude the assumption that autoimmune cytopenias are caused by a change in the antigen under the influence of drugs, a virus, or bacteria. Even minor changes in the structure of the autoantigen can lead to a breakdown in tolerance. Probably also the possibility of cross-immune reactions due to the similarity of antigenic determinants of bacteria and platelets. To predict the effectiveness of glucocorticosteroids in hormone-resistant patients, the authors found an increase in the proportion of immature cells, a decrease in the proportion of suppressor T-lymphocytes, and an increase in the number of circulating immune complexes (CIC). In such patients, the initial content of cortisol in plasma was reduced, and the cortisol-resistant fraction of lymphocytes was increased. Kerimov A.A. et al. believe that, based on immunological parameters, it is possible to predict the effectiveness of glucocorticosteroids. A number of authors, using the method of a panel of monoclonal antibodies, studied in more detail the shifts in the lymphocyte system in patients with ITP. An increase in the proportion of B-lymphocytes, a total

decrease in T-lymphocytes, a violation of the ratio of T-helpers / T- suppressors due to a decrease in the former were established. After splenectomy, the proportion of B-lymphocytes, especially activated ones, decreases, the total proportion of T-lymphocytes decreases, and the T-helper/T- suppressor ratio partially normalizes due to a decrease in the proportion of T- suppressors. The works of Bulanova T.D. et al. back in 1978, it was established that the percentage of T- and B-lymphocytes in peripheral blood depends on the severity of the disease. T-lymphocytes play a role in preventing the development of an autoimmune process, so a decrease in T-cells indicates a violation of the controlling function of the B-system. The shift in the ratio of T/B-lymphocytes is more pronounced in the acute form of ITP. After 2-3 weeks of corticosteroid therapy, the indicator approaches the norm. Therefore, the study of the T- and / B-lymphocyte system in patients with ITP is not only of diagnostic value, but also determines the effectiveness of treatment. New data received by Macro K. et al. In patients with ITP, he noted a significant increase in the content of circulating immune complexes (CIC) in the blood plasma 4.06 Y 0.44 g/l, as well as an increase in the concentration of IgG and Ig M. _ Macchi L. _et al. , did not find IgM on the platelet surface of patients with ITP, but the content of IgG and IgA, as well as albumin on platelets, was 2-3 times higher than normal values. Macro K. et al., noted that with an increase in the duration of the course of ITP, progressive liver dysfunction develops. Data from laboratory tests indicate an increase in the content of IgM and IgA and a decrease in the content of albumin, changes in lipid metabolism, an increase in free bilirubin, and an increase in alkaline phosphatase activity. Positive changes in the protein-forming, pigment, lipid functions of the liver, and iron metabolism after splenectomy confirm the assumption of a single mechanism for their occurrence, and the degree of change depends on the duration of the disease. In favor of the primary defect of hematopoietic cells of the immune mechanism as the main factors in the pathogenesis of these disorders, Macchi's arguments are put forward. L. _ et al. Immune reactions in bone marrow failure are often interpreted as a secondary response to "altered" hematopoiesis. Tomiyama et al., found autoantibodies to the

glycoprotein complex II/ IIIa of the platelet membrane in 14 (58.3 % ) of 24 patients with chronic ITP and in 4 (26.7%) of 15 patients with acute ITP. On this basis, the authors believe that acute and chronic ITP have different mechanisms of development; autoimmune antiplatelet antibodies play an important role only in the pathogenesis of chronic ITP in both children and adults. The presence of autoantibodies against platelet envelope glycoproteins was proven in the work of Proctor S. _ G. _ et al ., McMillan R. _ In patients with ITP, the main mechanism of thrombocytopenia is an increased breakdown of platelets in the organs of the RES (mainly in the spleen and liver) under the influence of circulating antibodies or the antigen-antibody complex. In 46 examined patients with thrombocytopenia, this mechanism was manifested by a significant reduction in the life of platelets in 20. blood flow - up to 2.8 days at a rate of 8.5. The destruction of platelets is thought to be the result of sequestration rather than cytolysis or agglutination. The authors observed 3 types of sequestration: in 50% of patients, the predominant cell breakdown occurred in the spleen, in *25%* - simultaneously in the spleen and liver, in 25% - only in the liver. The hepatic type of sequestration is associated with an increased titer of antiplatelet antibodies. In patients with hepatic type of sequestration, the life expectancy of platelets was on average

- 2.06 days, and in patients with splenic type - 3.71 days.

Klimansky V.A. , even earlier revealed that sequestration depends on the degree of thrombocytopenia: relatively mild forms are characterized by the predominant destruction of platelets in the spleen, and more severe

- in the spleen and liver, or only in the liver. The authors showed that the type of sequestration in patients with ITP determines the effect of splenectomy. The best effect was obtained in patients with splenic type of platelet sequestration. In patients with extrasplenic type of sequestration, the effect of splenectomy was temporary; often relapsed. The use in these cases of subsequent therapy with immunosuppressants for 1-2 months gave clinical remission.

Pathogenetic treatment of ITP currently consists of the use of corticosteroid drugs, splenectomy and immunosuppressive therapy.

## LITERATURE


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