

## ANALYSIS OF LABORATORY ABNORMALITIES IN PATIENTS WITH IMMUNE THROMBOCYTOPENIA

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### ABSTRACT

**Objective:** To analyze the characteristics of laboratory abnormalities in patients with immune thrombocytopenia depending on disease severity.

**Materials and methods:** The study included 91 patients diagnosed with ITP in medical institutions of the Surkhandarya region from 2020 to 2024. Methods included clinical laboratory, morphological, and statistical studies.

**Results:** Along with the main laboratory criterion of ITP - the presence of varying degrees of platelet reduction - changes in peripheral blood hematological parameters were characterized by a decrease in hemoglobin and erythrocytes, corresponding to mild (in moderate thrombocytopenia) and moderate (in severe thrombocytopenia) anemia. The bone marrow hematopoiesis showed sufficient cellularity and a normoblastic type of hematopoiesis, accompanied by an increase in the number of megakaryocytes, mainly those not containing platelets.

**Keywords:** immune thrombocytopenia, Surkhandarya region, severity of thrombocytopenia, peripheral blood, myelogram, megakaryocytes, platelets.

**Introduction:** In daily practice, doctors of almost all specialties encounter various manifestations of immune thrombocytopenia (ITP) [4, 7]. Untimely and delayed diagnosis leads to prolonged unjustified treatment tactics in patients, as well as long-term bleeding that reduces their quality of life for many years [1, 5, 6, 8].

Despite the long period of studying ITP, its etiology and pathogenetic mechanisms remain poorly understood [2, 3]. The question of the causes and conditions contributing to its occurrence remains controversial to this day [11,13]. However, it is known that exogenous and endogenous factors play an important role in the development and chronicity of ITP, leading to complex disorders in the body [12,14].

**Objective:** To analyze and compare the frequency of clinical manifestations in patients with immune thrombocytopenia depending on disease severity.

**Materials and methods:** The study included 91 patients with ITP aged 18 to 80 years (median age 41.2±3.9 years) from Termez city and districts of the Surkhandarya region. The diagnosis of ITP was established based on international criteria (2019), clinical examination results, and laboratory data (complete blood count, bone marrow examination) [9, 10]. Statistical analysis was performed using the "Statistic for Windows, 2017" software package.

**Results and discussion:** Laboratory manifestations of the disease (peripheral blood and bone marrow analysis) were assessed in the main group of ITP patients and according to thrombocytopenia severity. Analysis of median hematological parameters in peripheral blood in the main group of ITP patients revealed significantly lower hemoglobin values (1.5 times lower,  $P<0.001$ ) compared to the control group, accompanied by a decrease in erythrocyte count (1.3 times lower,  $P<0.01$ ).

The main diagnostic criterion for ITP was a platelet count below  $100 \times 10^9/L$ . Compared to the control group, the platelet count in the main group was significantly reduced by 6.3 times ( $P < 0.001$ ).

Although the leukocyte count did not deviate from the normal range, its median in the main ITP group was statistically significantly lower than in the control group by 1.6 times ( $P < 0.05$ ). All leukocyte subpopulations in the differential count were within normal limits.

The dynamics of average hematological parameters in peripheral blood for moderate, medium, and severe thrombocytopenia were characterized by a decrease in median hemoglobin and erythrocyte values by 1.2 ( $P > 0.05$ ) and 1.1 ( $P > 0.05$ ); 1.4 ( $P < 0.05$ ) and 1.2 ( $P > 0.05$ ); 1.5 ( $P < 0.05$ ) and 1.44 ( $P < 0.05$ ) times, respectively.

Compared to the control group, the median platelet count in patients with mild thrombocytopenia was 4.03 times lower ( $P < 0.001$ ), with moderate ITP 6.5 times lower ( $P < 0.001$ ), and with severe ITP 12.6 times lower ( $P < 0.001$ ).

The leukocyte median, as in the main group, was lower than the control group median by 1.6 times ( $P < 0.01$ ), 1.52 times ( $P < 0.01$ ), and 1.4 times ( $P < 0.01$ ) for mild, moderate, and severe ITP, respectively.

All leukocyte subpopulations, except for a slight increase in basophils, were within normal limits. Compared to the control median, lymphocytes increased to  $37.7 \pm 2.94\%$  ( $P > 0.05$ ) in mild thrombocytopenia, were  $35.5 \pm 2.53\%$  ( $P > 0.05$ ) in moderate ITP, and decreased to  $31.2 \pm 2.1\%$  ( $P > 0.05$ ) in severe ITP.

At the same time, considering the severity of thrombocytopenia, basophils and eosinophils increased to  $1.36 \pm 0.09\%$  ( $P > 0.05$ ) and  $4.5 \pm 0.20\%$  ( $P < 0.05$ ),  $1.37 \pm 0.12\%$  ( $P > 0.05$ ) and  $4.1 \pm 0.22\%$  ( $P < 0.05$ ),  $1.56 \pm 0.22\%$  ( $P > 0.05$ ) and  $5.1 \pm 0.29\%$  ( $P < 0.05$ ).

The median of band and segmented neutrophils reached  $5.6 \pm 0.92\%$  ( $P > 0.05$ ) and  $65.30 \pm 4.37\%$  ( $P < 0.05$ ),  $5.3 \pm 0.71\%$  ( $P > 0.05$ ) and  $61.12 \pm 3.66\%$  ( $P < 0.05$ ),  $4.2 \pm 0.9\%$  ( $P > 0.05$ ) and  $55.6 \pm 3.8\%$  ( $P < 0.05$ ) respectively, depending on the severity of ITP.

The average ESR indicators, as in the main group, were also higher in all degrees of ITP severity than in the control group by 1.2 ( $P < 0.05$ ), 1.4 ( $P < 0.05$ ) and 1.75 ( $P > 0.05$ ) times, respectively.

Thus, according to CBC data, it can be concluded that all signs of ITP are present: a decrease in hemoglobin concentration, cytopenia (a decrease in the number of erythrocytes, platelets, and leukocytes), absolute neutropenia, relative lymphocytosis, and accelerated ESR.

For a reliable diagnosis of ITP, all patients underwent analyses of the bone marrow sternal punctate, i.e., a morphological analysis of the myelogram.

By assessing the quantitative and morphological picture based on myelogram data in the main group with ITP, a normoblastic type of hematopoiesis was identified. The normal number of blast cells ( $1.2 \pm 0.02\%$ ) served as an important bone marrow marker that distinguished ITP from systemic oncohematological diseases.

At the same time, a characteristic bone marrow indicator for the disease was an increase in the total number of megakaryocytes (MGC) to  $34.3 \pm 0.12$  ( $P < 0.001$ ) due to an increase in platelet-free forms of MGC ( $30.1 \pm 0.3$ ;  $P < 0.01$ ), the number of which was increased due to the rapid detachment of platelets and their entry into the peripheral blood, where their accelerated elimination in the spleen was observed due to the attack of antiplatelet antibodies on them.

Regardless of the severity, a similar picture was characteristic of all groups of patients with ITP in the bone marrow, which, additionally, differed in a more pronounced increase in the total number of MGCs and their platelet-free forms.

Along with the absence of an increase in normal values of blast cells in all degrees of ITP severity, in moderate thrombocytopenia, the median of the total number of MGCs reached  $24.3 \pm 2.28$  ( $P < 0.001$ ), and the forms containing and not containing platelets, respectively,  $7.2 \pm 0.8$  ( $P > 0.05$ ) and  $17.2 \pm 2.47$  ( $P < 0.001$ ).

At the same time, with moderate severity, the total number of MGCs increased to  $32.7 \pm 3.10$  ( $P < 0.001$ ), and MGCs with and without platelets increased to  $3.6 \pm 0.16$  ( $P > 0.05$ ) and  $29.1 \pm 3.02$  ( $P < 0.001$ ), respectively.

Additionally, in severe thrombocytopenia, the total number of MGCs increased to  $36.5 \pm 3.2$  ( $P < 0.001$ ), and MGCs with and without platelets increased to  $3.8 \pm 0.18$  ( $P > 0.05$ ) and  $32.7 \pm 3.53$  ( $P < 0.001$ ), respectively.

Conclusion. Thus, along with the main laboratory criterion of ITP, the presence of varying degrees of platelet decrease, changes in peripheral blood hematological parameters were characterized by a decrease in hemoglobin and erythrocytes, corresponding to mild (in moderate and moderately severe thrombocytopenia) and moderate (in severe thrombocytopenia) anemia severity. The bone marrow hematopoiesis picture showed sufficient cellularity and a normoblastic type of hematopoiesis, accompanied by an increase in the number of MGCs due to platelet-free forms.

#### **LITERATURE**

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