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ASSESSMENT OF CLINICAL AND LABORATORY FEATURES OF PERIPHERAL BLOOD AND BONE MARROW INDICATORS IN IMMUNE THROMBOCYTOPENIA

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Relevance: The development of immune thrombocytopenia is determined by very complex processes, which result from the complex interaction of various factors, both endogenous and exogenous. The mechanism of immune thrombocytopenia development is diverse, ambiguous, contradictory, and not fully understood, and many statements require further research to promote progress in a deeper understanding of the pathogenesis of the disease, the development of new diagnostic and prognostic criteria for immune thrombocytopenia.

Research materials and methods: The scientific study involved 60 patients with idiopathic thrombocytopenia and 20 conditionally healthy individuals without pathology in the hemostasis system. The patients were selected by random sampling when visiting the Khorezm Regional OMMC, Hematology Department, from 2024 to 2026. The age of the participants ranged from 18 to 60 years (median 37.3±4.8 years). The diagnosis of immune thrombocytopenia was verified according to the recommendations of international experts and the international consensus.

Laboratory examination included a complete blood count, coagulation profile, hemostasis system tests, myelogram, and statistical analysis methods.

Purpose of the study: To study and evaluate the clinical-laboratory features of peripheral blood, bone marrow, and the hemostasis system in patients with immune thrombocytopenia.

Results and Discussion: The indicators of the complete blood count and bone marrow in patients with immune thrombocytopenia indicated changes in hematological markers in the hemogram and myelogram.

From a hematological perspective, the blood of patients with immune thrombocytopenia showed changes in the hemostasis system, characterized by a

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decrease in blood clotting activity, leading to clinical manifestations of hemorrhagic syndrome, which depends on the severity of hemostasiological changes.

The detected disorders in the main group of patients with immune thrombocytopenia were characterized by an elongation of the activated partial thromboplastin time (APTT) by 1.8 times ($p<0.05$), a reduction in platelet count by 2.0 times ($p<0.05$), a decrease in platelet aggregation function by 2.1 and 2.25 times ($p<0.05$), and a reduction in blood clot retraction by 1.7 times ($p<0.05$), depending on the disease stage. This suggests the need for hemostasiological tests in predicting dangerous hemorrhagic complications in immune thrombocytopenia.

During the peak stage of the disease, a significant decrease in hemoglobin and erythrocyte levels was observed, reaching 94.1±3.8 g/L and 2.6±0.11 × 10^{12}/L, compared to 120.0±7.4 g/L and 4.5±1.13 × 10^{12}/L in the control group.

Table 1.

Changes in hematological markers in patients with immune thrombocytopenia (M±m)

General blood test results	Control group (n=20)	Main group (n=60)
Erythrocytes, ×10^{12}/L	4.6±0.26	2.65±0.09***
Hemoglobin, g/L	123,0±7,4	69,5±3,8***
MCV	1,02±0,03	0,8±0,01***
Reticulocytes, %	6,6±0,64	7,80±0,72***
Platelets count, ×10^9/L	230,0±15,82	90,8±3,3 **
Leukocytes, ×10^9/L	6,7±0,45	4,30±0,33
ESR, mm/h	5,0 ±0,30	15,0±0,80***

**Note: *- pI<0.05; - pI<0.01; - pI<0.001 significant compared to control group.*

These changes indicated disorders in platelet function, which were related to changes in the functional state of cells and the morphological composition of the circulating population.

A physiological response of the bone marrow to a sharp decrease in platelet count in patients with immune thrombocytopenia (90.8±3.3 × 10^9/L vs. 230.0±15.82 × 10^9/L in the control group) was observed, indicating a decrease in platelet levels. However, leukocyte count (6.30±0.33 × 10^9/L vs. 6.7±0.45 × 10^9/L in the control group) showed no significant differences.

Additionally, a slight acceleration of the erythrocyte sedimentation rate (ESR)

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was observed, which increased to 11.0±0.58 mm/h compared to 5.0±0.68 mm/h in the control group. The ESR was significantly higher in the main group by 2.2 and 3.6 times, which may indicate a decrease in the cell-plasma ratio in the blood composition due to the suppression of platelet generation.

Alongside the evaluation of hematological changes in the blood, we also studied the cellular composition of the bone marrow.

Thus, the thrombocyte lineage in the bone marrow was characterized by an increase in megakaryocytes from 10.1±0.03% in the control group to 14.07±0.09% in patients with immune thrombocytopenia.

Concomitantly, the number of differentiating cells in the megakaryocyte series — including promegakaryocytes, basophilic, polychromatophilic, and oxyphilic megakaryocytes — statistically significantly increased compared to the control group.

In particular, the level of promegakaryocytes increased to 6.20±0.09%, and the number of basophilic megakaryocytes increased to 8.34±0.11%. The content of polychromatophilic megakaryocytes increased to 16.8±0.06%, and oxyphilic megakaryocytes increased to 14.7±0.04%.

Table 2

Dynamics of bone marrow markers in patients with immune thrombocytopenia (M±m)

Indicator	Control group (n=20)	Main group (n=60)
Megakaryocytes, %	10,1±0,03	14,07±0,09***
Promegakaryocytes, %	1,5±0,04	6,20±0,09***
Basophilic megakaryocytes, %	3,5 ±0,1	8,34±0,11***
Polychromatophilic megakaryocytes, %	9,6 ±0,08	16,8±0,06 % ***
Oxyphilic megakaryocytes, %	3,7±0,07	14,7±0,04***

**Note: *- pI<0.05; - pI<0.01; - pI<0.001 significant compared to control group.*

Thus, the physiological response of the bone marrow to platelet destruction in the thrombocytic progenitor was an increase in its proliferative activity through accelerated maturation of megakaryocytes, promegakaryocytes, basophilic, polychromatophilic, and oxyphilic megakaryocytes.

Conclusion: The comparative analysis of the hematological indicators in the

main group of patients with immune thrombocytopenia demonstrated that during the acute stage of the disease, there was a significant decrease in hemoglobin levels and hemostasis system activity. This allowed for the identification of characteristic features of these disorders, with varying trends in the values of these indicators depending on the stage of the disease.

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