

## PHYSIOLOGY AND CLINICAL SIGNIFICANCE OF SHAPED BLOOD ELIMINATIONS

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**Abstract:** Blood is the vital biological fluid of the human body. It is involved in transporting oxygen, nutrients and hormones to all cells and tissues of the body, as well as in the removal of metabolic waste, the regulation of heat exchange and the provision of immune protection. It consists of blood plasma and a salivary element. Shapeable elements include erythrocytes (red blood cells), leukocytes (white blood cells), and platelets( blood platelets). Each of them has a unique physiological and clinical significance in the body.

**Keywords:** Blood, sugary elements, erythrocytes, leukocytes, platelets, hemoglobin, anemia, leukemia, thrombocytopenia, blood coagulation, hemostasis, immune system, bone marrow, physiology, clinical significance.

### **Red blood cells (red blood cells)**

Red blood cells are disk-shaped cells without a nucleus, with two bots, which form in the bone marrow. Their main task is to transport oxygen from the lungs to the tissues, and carbon dioxide - from tissues to the lungs. The main component of erythrocytes is hemoglobin – it is an iron-sparing protein responsible for binding and transporting oxygen.

In a healthy person, the life expectancy of red blood cells is about 120 days. Then they are broken down by the spleen and liver. A decrease in the number of red blood cells or a decrease in the level of hemoglobin leads to a condition called anemia (anemia). The most common types of anemia are iron deficiency anemia and megaloblastic anemia, which lead to disruption of the oxygen transport process, as a result of which hypoxia develops in the tissues.

Also, an excessive excess of red blood cells is called erythremia, which leads to blood clotting, thrombus formation and increased load of the cardiovascular system.

### **Leukocytes (white blood cells)**

Leukocytes are cells that protect the body from infection, viruses, bacterial, parasitic and tumor cells. They are divided into two large groups:

1. Granulocytes – neutrophils, eosinophils, basophils;
2. Agranulacids – lymphocytes and monocytes.

Neutrophils are the first line of defense in the inflammatory process, destroying microorganisms through phagocytosis.

Eosinophils – fights allergic reactions and parasitic infections.

Basophils are also a source of histamine and hemodynamic active substances.

**Lymphocytes** (T- and B-cells) form the immune system's memory, producing antibodies.

And the monocytes turn into macrophages in the tissues, phagocytosis of dead cells.

An increase in the number of leukocytes is called leukocytosis, and slippage is called **leukopenia**. One of the most severe pathological conditions is **leukemia (blood cancer)**, in which uncontrolled leukocytes multiply in the bone marrow and normal blood cell production is disrupted.

### **Platelets (blood platelets)**

Platelets are small nucleless cell fragments in the bone marrow **that secrete from megakaryocytes** and play an important role in the process of blood coagulation. They are the first to be active when a stroke is injured and form a **platelet blockage at** the site of the damage.

Platelets are involved in the initial stage of **the homeostasis** process. Their activity activates the biochemical stages of the blood coagulation system. With a decrease in platelets, **thrombocytopenia occurs, and** with increased platelets, **thrombocytosis** occurs. In thrombocytopenia, hemorrhages, hematomas occur, and in thrombocytosis, the risk of thrombosis vaembolism increases.

### **Physiological interdependence**

The elements of the cannig are inextricably linked to each other. For example, oxygen transported by red blood cells ensures the activity of leukocytes, while platelets stop bleeding, making it easier for immune cells to reach the damaged site. A deterioration in an element of any form adversely affects the activity of the whole organism.

### **Modern diagnostic and research methods**

In modern medicine, the following laboratory and instrumental methods are used to study the shaped elements of blood:

- **Total blood count (UQT/CBC)** – the basic test to determine the amount of red blood cells, leukocytes, and platelets.
- **Microscopic analysis** – evaluation of cell morphology.
- **Flow cytometry** is used to determine the state of the immune system.
- **Molecular diagnostics** - allows you to identify the genetic causes of blood diseases.

Thanks to these technologies, **there is an opportunity to detect and cure diseases such as** anemia, leukemia, hemophilia, immune deficiency at an early stage.

### **Conclusion**

Sugary elements of the blood - erythrocytes, leukocytes and platelets - are the most important components of human life. Their normal number and function provides homeostasis, immune protection and blood coagulation in the body. Any violation of them leads to severe pathological conditions. Therefore, the in-depth study of the physiology, pathology, and clinical

significance of these elements is of important scientific and practical importance in the field of medicine.

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