THE CORPUSCULAR ELEMENTS OF BLOOD

Xolmurodov Akbar
Asatullayev Rustamjon Baxtiyarovich

Abstract: *Blood is a vital fluid tissue that performs essential functions in the body, including oxygen transport, immune defense, and clot formation. It consists of plasma and corpuscular elements: red blood cells, white blood cells, and platelets. Red blood cells transport oxygen via hemoglobin, white blood cells defend against infections, and platelets facilitate blood clotting. The production of these cells occurs in the bone marrow through hematopoiesis, ensuring continuous replenishment. Blood composition is influenced by various factors such as hydration, physical activity, and medical conditions. Understanding the corpuscular elements of blood is crucial for diagnosing and managing hematological disorders.*

Keywords: *Blood, corpuscular elements, red blood cells, white blood cells, platelets, hematopoiesis, hemoglobin, immune system, blood clotting, homeostasis, hematology*

Blood is a vital fluid tissue that plays an essential role in the body's physiological processes. It helps regulate and support the activity of cells throughout the body. Blood consists of plasma and corpuscular elements, which include red blood cells, white blood cells, and platelets.

Red blood cells, or erythrocytes, are the most numerous elements in the blood, ranging from 4,000,000 to 5,000,000 per cubic millimeter. Their primary function is to transport oxygen. The number of red blood cells can fluctuate depending on factors such as age, physical exertion, and emotional stress. These cells have two important physical properties: elasticity and flexibility. These features allow them to pass through the smallest capillaries, ensuring oxygen delivery to tissues. Their disc-like shape provides a large surface area, which enhances oxygen exchange.

White blood cells, or leukocytes, are essential for the immune system. In a healthy person, the leukocyte count is typically 4,500 to 9,500 per cubic millimeter. However, after mental or physical exertion, eating, or mild activity, this number can rise to 10,000 or more. Unlike red blood cells, the count of white blood cells does not generally differ between sexes.

Platelets, or thrombocytes, play a crucial role in blood clotting, helping to prevent excessive bleeding when injuries occur. Though smaller in size, they are vital for maintaining proper blood circulation and wound healing.

Blood is a complex and dynamic tissue, constantly adjusting to the body's needs. Its corpuscular elements work together to transport oxygen, fight infections, and maintain stability within the circulatory system. Blood is a highly specialized fluid that circulates throughout the body, delivering essential substances such as oxygen and nutrients while removing waste products. It serves as a transport system for hormones, enzymes, and other

biochemical substances, playing a critical role in maintaining homeostasis. Additionally, blood helps regulate body temperature and pH levels, ensuring that physiological processes function optimally. The corpuscular elements of blood originate in the bone marrow through a process called hematopoiesis. Red blood cells, white blood cells, and platelets develop from stem cells in this process, each type serving a distinct function. While red blood cells transport oxygen, white blood cells are responsible for immune defense, and platelets contribute to clot formation, preventing excessive blood loss when vessels are damaged.

Red blood cells contain hemoglobin, an iron-rich protein that binds to oxygen in the lungs and releases it into tissues. Hemoglobin also carries a portion of carbon dioxide back to the lungs for exhalation. The lifespan of a red blood cell is approximately 120 days, after which it is broken down in the liver and spleen. The production of red blood cells is regulated by the hormone erythropoietin, which is released by the kidneys in response to low oxygen levels.

White blood cells, although fewer in number than red blood cells, are diverse and specialized. They include neutrophils, lymphocytes, monocytes, eosinophils, and basophils, each with a unique role in defending the body against infections, allergens, and foreign invaders. Some white blood cells are capable of phagocytosis, a process in which they engulf and destroy harmful microorganisms. Others contribute to the production of antibodies, which help the immune system recognize and neutralize pathogens.

Platelets are small, disk-shaped cell fragments that play a crucial role in blood clotting. When a blood vessel is injured, platelets adhere to the damaged site and release chemicals that stimulate the formation of a fibrin mesh, effectively sealing the wound. This process, known as hemostasis, prevents excessive blood loss and initiates tissue repair.

Blood volume and composition can be affected by various factors, including hydration levels, altitude, physical activity, and medical conditions. Dehydration can lead to a higher concentration of red blood cells, while conditions such as anemia result in reduced oxygen transport due to a lower red blood cell count. White blood cell levels may rise in response to infections, inflammation, or stress, while platelet disorders can affect blood clotting efficiency. The study of blood, known as hematology, is essential for diagnosing and treating a wide range of diseases, including anemia, leukemia, and clotting disorders. Blood tests are commonly used in medical examinations to assess overall health and detect abnormalities in cell counts or biochemical composition.

Blood is a remarkable fluid that sustains life by maintaining balance and responding to the body's changing needs. Its corpuscular elements work in harmony to protect, nourish, and repair the body, ensuring its continued function.

REFERENCES:

1. Hoffbrand, A. V., & Moss, P. A. H. (2019). Essential Haematology (7th ed.). Wiley-Blackwell.

2. Rodak, B. F., Fritsma, G. A., & Doig, K. (2020). Hematology: Clinical Principles and Applications (5th ed.). Elsevier.
3. Kaushansky, K., Lichtman, M. A., Prchal, J. T., Levi, M. M., Press, O. W., Burns, L. J., & Caligiuri, M. (2016). Williams Hematology (9th ed.). McGraw-Hill.
4. Guyton, A. C., & Hall, J. E. (2020). Textbook of Medical Physiology (14th ed.). Elsevier.
5. Kumar, V., Abbas, A. K., & Aster, J. C. (2020). Robbins & Cotran Pathologic Basis of Disease (10th ed.). Elsevier.
6. Pagana, K. D., & Pagana, T. J. (2021). Mosby’s Diagnostic and Laboratory Test Reference (15th ed.). Elsevier.
7. Turgeon, M. L. (2017). Clinical Hematology: Theory and Procedures (6th ed.). Wolters Kluwer.
8. Weatherall, D. J. (2018). The New Genetics and Clinical Practice (4th ed.). Oxford University Press.
9. Hoffbrand, A. V., Higgs, D. R., & Keeling, D. M. (2022). Postgraduate Haematology (8th ed.). Wiley-Blackwell.
10. Tuteja, S., & Rader, D. J. (2018). Lipoproteins, Lipids, and Cardiovascular Risk in Braunwald’s Heart Disease (11th ed.). Elsevier.