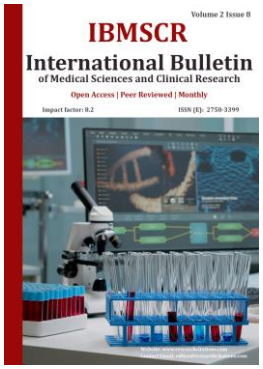

BLOOD COMPOSITION AND ITS BIOCHEMICAL INDICATORS DEPENDING ON AGE CHANGES

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Abstract: One of the most important issues in the world, especially in our republic, is to improve the health of the population. Taking this into account, it is important to identify the diseases of the cardiovascular system, which are the most common and cause early death, for early diagnosis and effective treatment. It is important to determine its composition, physical and chemical indicators, and changes in its composition depending on age. At this point, it should be recognized that the health of citizens and their medical rights are fully ensured by the law, which plays a special role in the formation of medical culture and the improvement of people's health.

Key words: blood, bilirubin, hemoglobin, biliverdin, immunoglobulins, form elements, glucose.

Blood is the main internal medium and solution of the body. Substances from the external environment, metabolic products of cells and tissues are constantly entering the blood. Blood has a red, sticky, weakly alkaline environment. it is a heterogeneous substance with a pH of 7.36-7.4 in adults, 7.2-7.3 in newborns, a specific gravity of 1.050-1.060, and 1.060-1.080 in infants.

If the total blood volume of a newborn child is 0.7 l, it is 1.3 at the age of 5, 2.5 at the age of 10, 4.5 at the age of 15, and 5.0-5.5 l at the age of adults. In adults, blood makes up 7% of body weight, while in young children, this indicator is 2-3 times more.

When the blood is centrifuged, its cells (erythrocytes, leukocytes, platelets) settle down. Above the sediment remains a pale yellow clear liquid - blood plasma. Plasma contains about 7% protein and various molecular substances. The plasma coagulates within a few minutes, that is, a clot is formed. As a result of this clot contraction, blood serum is separated. Blood serum differs from plasma in that it does not contain fibrinogen protein. When plasma clots, fibrinogen turns into insoluble fibrin. It is fibrin that forms the cartilage.

In addition to blood cells - erythrocytes, leukocytes, platelets, blood also includes organic and inorganic compounds. The most important organic compounds are proteins, fats, carbohydrates, hormones, enzymes, vitamins.

Blood also contains intermediate and final products of metabolic processes and mineral salts.

Despite the continuous flow of various substances into and out of the blood, the normal morphological and chemical composition of the blood does not change. temporary changes in the blood of a healthy person are quickly corrected. However, in many diseases, especially liver, heart, kidney, pancreas, and lung diseases, it can be observed that the chemical composition of blood has changed as a result of its functional condition.

Blood is the main indicator of a change in the state of the human body. Studying the biochemical indicators of blood, knowing the level of metabolism of the human body is important in the diagnosis and treatment of the disease.

DETERMINATION OF PROTEIN AND NON-PROTEIN PARTS OF BLOOD

The non-protein part of the blood is divided into nitrogen-fixing and nitrogen-free substances.

Non-nitrogenous substances include glucose, fats, fatty acid derivatives, pyruvate and lactic acid.

Nitrogen-fixing substances include fractions of nitrogen packages (intermediate and final products of simple and complex protein metabolism, uric acid, uric acid, creatine, ammonia, indican, bilirubin, polypeptides, amino acids, etc. The nitrogen of these substances is called nitrogenous residues, because they are protein remains in the filtered filter.Also, blood contains macro and microelements.

DETERMINATION OF BLOOD HEMOGLOBIN

The corpuscle that gives color to the blood is the protein hemoglobin of the erythrocyte. Hemoglobin is a representative of complex proteins - chromoproteins. It consists of a globin protein and a non-protein part - heme.

The amount of hemoglobin in the blood of newborn children is slightly higher than that of adults (170-180 g/l). In the first hours of life, this indicator increases to 200-250 g/l. From the 2-3rd day of life, the amount of hemoglobin slowly decreases and by the end of the first month, it is equal to the hemoglobin of adult blood (160 g/l). The decrease in the amount of hemoglobin continues until the baby is one year old, and this indicator reaches 105-110 g/l. From the age of two, this index increases further and becomes similar to adult hemoglobin during adulthood.

Human hemoglobin differs not only in quantity, but also in quality. In the 7th and 14th weeks of fetal development, very simple - primitive hemoglobin is found in the blood of the embryo, which is composed of 2 fractions and is quickly replaced by fetal hemoglobin (fetal hemoglobin). This hemoglobin is

usually lost around the time of birth. Fetal Hb develops in the 3rd month of the fetus, and by the time of birth, its amount is 80-90% of all hemoglobin.

In the first year of the child's development, fetal Hb decreases sharply, and by the time he reaches one year of age, it is 1-4%. Hemoglobinemia occurs during the early development of the fetus and later becomes the main hemoglobin.

Changes in the amount of adult and fetal hemoglobin in different periods are given in the table below

Changes in the amount of fetal and fetal hemoglobin at different ages

BLOOD SERUM BILIRUBIN

The lifespan of erythrocyte hemoglobin is 110-130 days. Over time, hemoglobin breaks down in the reticuloendothelial system of the bone marrow, liver, and spleen. Iron and globin protein are separated from the flour decomposition process and green bile pigment (biliverdin) is formed. Biliverdin is converted into yellow-reddish bilirubin. Bilirubin is a breakdown product of heme. Bilirubin enters the blood and binds with blood albumins and is delivered to the liver. Blood serum contains two types of bilirubin:

1. Free bilirubin. It does not dissolve in water, it is toxic, it cannot pass through the kidney filter. It cannot be excreted through bile and urine. After dissolving in chloroform and other organic solutions, free bilirubin interacts with the diazo reagent (improper diazo reaction). Therefore, such bilirubin is called incorrect bilirubin.

Toxic, free, uncorrected bilirubin is detoxified by binding to glucuronic acid in the liver. Glucuronic acid occurs as the active UDF glucuronic acid. Glucuronic acid is transferred to bilirubin by the enzyme glucuronide transferase. Such bound bilirubin diglucuronide is quite non-toxic and soluble in water. It can pass through the kidney filter, through the cell membrane to the bile capillaries, and from there to the small intestine. As a result of the process of digestion in the intestine, bound bilirubin is formed into mesobilirubin, urobilinogen, and sterocobilinogen. A person excretes 300 mg of stercobilin a day with feces. A part of sterkolinogen passes to the liver through hemorrhoidal veins. There, urobilinogen breaks down to cirrole compounds and is partially absorbed into bile. As a result of liver dysfunction, urobilinogen enters the general blood stream and is excreted with urine as its pathological element.

A high level of bilirubin is observed in the blood of newborns, especially premature children. In physiological jaundice, it is observed that the amount of bilirubin increases several times due to free bilirubin.

This indicates that the UDF-glucurinyltransferase enzyme of the liver is insufficient, and it cannot convert bilirubin into diglucuronide.

Healthy people do not have bilirubin in their urine. Disruption of bilirubin metabolism is often associated with the development of jaundice. In this regard, determining the type and amount of serum bilirubin is important in differentiating jaundice.

In healthy people, total bilirubin in blood serum is 1.7-20.5 μmol/l (0.1-1.2 mg 100 ml), free bilirubin is 1.7-17.1 μmol/l (0.1 -1.0 mg 100 ml), bound bilirubin 0.86-4.3 μ mol/l (0.05 -0.25 mg 100 ml). The amount of bilirubin in young children is presented in the table.

BLOOD PLASMA PROTEINS

6.5-8.5% of dry plasma in 9-10% of blood corresponds to proteins. Blood plasma proteins can be divided into 3 groups: albumins, globulins, fibrinogen. Albumin in blood plasma is 20-30 g/l, fibrinogen is 2-4 g/l. In newborns, this indicator is lower than in adults. In the first month of a child's life, the amount of protein decreases even more (up to 45-55 g/l), and then it starts to rise gradually, and after 7 years of age, it is equal to the protein of an adult.

Blood plasma proteins are mostly synthesized in the liver and reticuloendothelial system. Blood plasma proteins are of great physiological importance.

1. Proteins provide blood viscosity, blood viscosity ensures the uniform distribution of erythrocytes, the movement of leukocytes, the flow of blood through blood vessels and the passage of capillary walls.

2. Proteins, being hydrophilic and colloid, bind a certain amount of water and keep it in the bloodstream. According to this property, protein adjusts colloid - osmotic (oncotic) pressure and does not change blood volume. Albumins are especially important in this respect.

3. Proteins participate in the transport of various substances (ions, fats, pigments, vitamins, hormones, drugs, etc.). They form a complex with these substances and deliver them to tissues. Albumin is important in controlling this process. But there are proteins in plasma that can transport only selected compounds.

For example, transferrin is an iron carrier, ceruloplasmin is a copper carrier, haptoglobulins combine only with hemoglobins.

4. Proteins form protein buffer systems and take part in maintaining a constant blood environment.

5. Relatively binds with ions, maintains the constant of cations in the blood, most of iron, copper, magnesium and 40-50% are bound with blood plasma proteins.

6. Certain proteins of plasma - (fibrinogen, prothrombin, etc.) take part in blood clotting and transport (immunoglobulins), thereby performing a protective function.

7. Proteins are amino acid reserves.

Proteins are divided into 5 fractions by paper electrophoresis carried out in an alkaline environment: albumins, alpha, alpha1, beta and gamma globulins. The ratio of these fractions changes during development.

The blood plasma of newborn children is represented by a high amount of gamma globulins. Later, this amount decreases, and by the time the child reaches the age of 3, it is equal to the adult gamma globulin. Also, in newborns, fibrinogen protein is lower than in adults, and when the child is one month old, it reaches 2.0-4.0 g/l.

Certain proteins - haptoglobulins are not normally found in the blood of newborns. It appears when the child is one month old, and when it reaches 6 months, it becomes similar to that of adults, and after 6 months, it reaches 100-120 mg%.

CONCLUSION: In some diseases of children, an increase (hyperproteinemia) or decrease (hypoproteinemia) of protein is observed. Hyperproteinemia often occurs when children are malnourished, drink less fluid, have diarrhea, etc.

A slight change in blood plasma fractions, the appearance of anomalous proteins is called paraproteinemia. Paraproteinemia is observed in myeloma, in which one or more globulin fractions are sharply increased.

Total protein content reaches 100-160 g/l. Pathological macroglobulins are found in Waldenström's disease. In some cases, there is a decrease or complete absence of proteins in the plasma of young children. Excessive reduction of one of the protein fractions is called defectoroteinemia. These include analbunemia, afibrinogenemia, agamma- and hypogammaglobulinemia.

Hypoproteinemia - a decrease in the amount of protein is observed in kidney disease - nephritis, malignant tumors, alimentary dystrophies.

In the chronic stage of rheumatism, the amount of alpha and beta globulins increases. There is an increase in gammaglobulins in infectious diseases, a sharp decrease in the amount of albumins and an increase in gammaglobulins in liver cirrhosis, an increase in albumin fractions in kidney diseases (9 nephritis, fatty nephromas, toxicosis of pregnancy, etc.). In the above various pathological conditions, studying the level and nature of changes in the blood plasma protein fraction is of great importance in the diagnosis of diseases.

References:

1. Biokimyo. T.S. Saatov, A.Z. Zikiryayev, T.M. Saidov. 2009y
2. Biokimyo. Raxmatov N.A, Maxmudov T.
3. Asfandyorov J. et al. Cardiovascular diseases. Hypertension and hypertenic crisis //Eurasian Journal of Medical and Natural Sciences. – 2022. – Т. 2. – №. 11. – С. 209-210.
4. Asfandyorov J. et al. SYPHILIS (DISEASE), ITS SYMPTOMS AND PRIMARY CONSEQUENCES //International Bulletin of Medical Sciences and Clinical Research. – 2022. – Т. 2. – №. 10. – С. 10-11.
5. Asfandiyorov J. et al. OSTEOPOROSIS AND ITS PREVENTION //Eurasian Journal of Medical and Natural Sciences. – 2023. – Т. 3. – №. 1. – С. 139-142.
6. Mirzaali o'g'li AJ va boshqalar. Jigar tuzilishi va funktsiyalari, gepatotsitlar haqida ma'lumot //Amerika iqtisodiyot va biznesni boshqarish jurnali. – 2022. – Т. 5. – №. 11. – S. 215-216.
7. Tashboltayevna A. S. et al. LEISHMANIOSIS DISEASE, ITS SYMPTOMS, PRIMARY CONSEQUENCES AND DISTRIBUTION //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 12. – С. 836-838.
8. Choriyeva Zulfiya Yusupovna, Asfandyorov Javodbek Mirzaali o'g'li, Ximmatov Adashmurod Sobir o'g'li, Mardonov Mirzabek Begzod o'g'li, & Rashidov Abdulaziz Ashurali o'g'li. (2023). ANAPHYLACTIC SHOCK. *Journal of Universal Science Research*, *1*(1), 47–50.
9. Ташниязов Х. Б., Асфандиёров Ж. М., Ашуров А. Т. ИССЛЕДОВАНИЕ ОСОБЕННОСТИ ЦИТОМОРФОЛОГИИ В КЛЕТКАХ БУККАЛЬНОГО ЭПИТЕЛИЯ КУРЯЩИХ СТУДЕНТОВ ТЕРМЕЗСКОГО ФИЛИАЛА ТАШКЕНТСКОЙ МЕДИЦИНСКОЙ АКАДЕМИИ //International Bulletin of Medical Sciences and Clinical Research. – 2023. – Т. 3. – №. 2. – С. 62-67.
10. Shadiev R. et al. Comparing effects of STR versus SELT on cognitive load //2019 Twelfth International Conference on Ubi-Media Computing (Ubi-Media). – IEEE, 2019. – С. 284-287.

Shadiev R. et al. Smart watches for making EFL learning effective, healthy, and happy //Challenges and Solutions in Smart Learning: Proceeding of 2018 International Conference on Smart Learning Environments, Beijing, China. – Springer Singapore, 2018. – С. 73-76.