

DETERMINATION OF CONDUCTIVITY PROPERTIES OF WASHED DONOR BLOOD ERYTHROCYTES

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Studying the rheological properties of blood occupies one of the most important places among biomedical problems. The great interest in studying various aspects of this issue is not accidental, because the delivery of oxygen, glucose, amino acids, fats, vitamins, mineral salts, hormones, as well as metabolites to tissues depends on the efficiency of blood oxygen transport. Erythrocytes are the main oxygen carriers, so damage to their membranes for any reason leads to a violation of the oxygen balance. A number of authors proved that various diseases (injuries, sepsis, poisoning with psychotropic drugs, etc.) change the structural properties of the erythrocyte membrane.

The purpose of the study is to study the permeability of washed donor blood erythrocytes to blood plasma components.

Research material and methods. The research was conducted in the laboratory of the Republican Blood Transfusion Center and the Department of Biochemistry of the Tashkent Pediatric Medical Institute. Blood taken from donors served as the object of our scientific research. Blood collected from donors was separated into erythrocyte mass and plasma by centrifugation. Erythrocyte mass washed erythrocytes were obtained, in which donor blood was mixed with a 3.8% solution of sodium citrate in a ratio of 1:9, it was separated into plasma and erythrocytes during centrifugation at a speed of 2000 revolutions/minute for 10 minutes, placed in centrifuge tubes. The obtained erythrocytes were washed with a 0.9% solution of sodium chloride, and this process was repeated three times. To determine the permeability of erythrocytes, the collected blood is centrifuged for 5 minutes at a speed of 2500 rpm. Serum albumin, urea, creatinine, triglyceride, cholesterol, total protein, high-density lipoprotein, and low-density lipoprotein levels were determined using a HumaStar 100 automatic biochemical analyzer (Human, Germany). At the next stage, 1 ml of erythrocytes are extracted, 1 ml of this blood serum is re-infused and thoroughly mixed, after 10 minutes it is centrifuged at 2500 revolutions/minute for 5 minutes, the above biochemical indicators are determined repeatedly in the obtained blood serum.

Analysis of the obtained results. When the permeability of erythrocytes was determined in the experiment, the amount of albumin decreased from 32.0 ± 1.39 g/l to 23.00 ± 0.45 g/l after the experiment, and 28.13% of albumin in the plasma was absorbed by erythrocytes.

Cholesterol decreased from 1.74 ± 0.11 mmol/l to 0.76 ± 0.06 mmol/l, the biggest difference was 0.98 mmol/l amount (56.32%) in erythrocytes. Glucose decreased from 22.1 ± 1.19 mmol/l to 13.72 ± 0.22 mmol/l, that is, 37.92% passed to the component of erythrocytes. Density is high (from 0.46 ± 0.04 mmol/l to 0.31 ± 0.02 mmol/l) and low (from 0.71 ± 0.03 mmol/l to 0.52 ± 0.01 mmol/l) the amount of lipoproteins decreased by 33.87 and 26.99%, respectively. Total protein in plasma decreased from 48.0 ± 2.49 mmol/l to 33.6 ± 1.35 mmol/l, and 30.00% (14.4 g/l) was absorbed into erythrocytes after the experiment. The amount of triglyceride absorbed into erythrocytes was 0.22 mmol/l, and 27.79% of it was transferred from plasma to the component of erythrocytes. The amount of urea before the experiment (3.10 ± 0.17 mmol/l) compared to the amount after the experiment (2.18 ± 0.15 mmol/l) decreased by 29.68% (0.92 mmol/l), and the amount of creatinine (from 135.0 ± 3.49 mmol/l to 103.40 ± 1.77 mmol/l) it was determined that 23.41% was absorbed into erythrocytes. It should be noted that when the pre- and post-exercise indicators were compared to each other, the differences were significant ($r < 0.001$) in all cases.

Conclusion: Taking into account the permeability of erythrocytes contained in washed donor blood, they can be used in medical practice.

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