PERMEABILITY PROPERTIES OF FILTERED DONOR BLOOD ERYTHROCYTES

Kurbanova L. J.
Tashkent Medical Academy

The main purpose of transfusion of donor blood to patients who have been injured or who have lost a lot of blood is to maintain the gas-carrying properties of blood and restore the volume of circulating blood in the body. According to the recommendations of the World Health Organization, blood itself and its components obtained by centrifugation are used for blood transfusion in clinical practice: erythrocyte mass, plasma, platelet concentrate, etc. Storage of donated blood requires compliance with a number of strict technological and physiological rules. It is necessary to ensure the temperature of blood storage, to meet the requirements for storing and transporting a sealed package with anticoagulants and preservative solutions.
Scientific studies on cellular changes associated with erythrocyte storage injuries have so far failed to establish a reliable biomarker for degratification. However, these cellular changes collectively reduce erythrocyte injury and thus make this indicator a powerful biomarker of potential damage to erythrocyte aggregation. Previous studies have shown that damage to cold-stored erythrocytes is relatively stable during the first 14 days, but begins to worsen after 3 weeks of storage. This change is consistent with clinical data showing a significant decrease in transfusion efficiency after one month of storage. Loss of erythrocyte damage may affect transfusion efficiency, as stiffer erythrocytes may be taken up more rapidly by reticuloendothelial macrophages. In addition, transfused solid erythrocytes can disrupt blood flow in microvessels by occluding blood capillaries.

The purpose of the study is to study the permeability of erythrocytes in filtered donor blood 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. The erythrocyte mass of donor blood is passed through a leukofilter and leukocytes are separated. 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 is determined in the experiment, we can see different situations in the experiment conducted in filtered blood. In particular, high-density and low-density lipoproteins were not detected in the plasma before and after the experiment, and glucose was not detected after the experiment. 3.18% of plasma albumin was absorbed into erythrocytes. Cholesterol increased from 1.74±0.05 mmol/l to 2.05±0.06 mmol/l, the difference in plasma was 0.31 mmol/l, and 17.11% of it remained in erythrocytes. Total protein in plasma increased from 60.0±1.05 mmol/l to 59.8±1.50 mmol/l, and 0.2 g/l (0.33%) of erythrocytes were absorbed after the experiment. The amount of urea before the experiment (0.97±0.02 mmol/l) compared to the amount after the experiment (1.02±0.03 mmol/l) increased by 4.83% (0.5 mmol/l), and the amount of creatinine before the experiment it was 151.0±1.82 mmol/l, after the experiment it was 149.0±1.84 mmol/l, which indicates that 1.32% of it was not absorbed into erythrocytes. It should be noted that when the pre- and post-exercise indicators were compared to each other, the differences were significant in all cases.

Conclusion: Given the permeability of erythrocytes in filtered donor blood, they can be used in medical practice.

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