

THE INDEXES OF ERYTHROCYTES CHARACTERIZED FORMATION OF OXIDATIVE-REDOX POTENTIAL UNDER SOME CARDIOVASCULAR AND HAEMATOLOGICAL DISEASES

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It is known, that under different diseases the balance in prooxidative and antioxidative processes is destroyed and oxidative and nitric oxide stress is realized. These processes are connected with production of oxygen and nitric active forms, that leads to changes of molecular and cellular structures [1–3]. Today we have much data about that under some diseases erythrocytes are involved in pathological process as demonstrated by biochemical changes occurring in them [4–6].

In this regard, it is interest to examine the state of the system, that is connected with formation of redox potential in erythrocytes under some cardiovascular and haematological diseases, that was the aim of our work.

The materials for the study were the erythrocytes of healthy subjects (control group) and patients with dilated cardiomyopathy (20 persons, middle age 49,5 years), ischemic heart disease (25 persons, middle age 50,0 years), erythraemia (9 persons, middle age 60,0 years), aplastic anemia (11 persons, middle age 56,0 years) and iron-deficiency anemia (9 persons, middle age 49,0 years). The blood of patients with diseases was taken before treatment for an illness.

The erythrocytes were hemolysated by distilled water. In hemolysates of erythrocytes the activity of glucose-6-phosphate-dehydrogenase [7] and glutation-reductase [8] and content of low-molecular nitrosothiols (LMNT) [9] were determined. All indexes were studied by spectrophotometric methods of biochemical analyses.

It has been shown, that in hemolysates of erythrocytes in all groups of patients the activity of glucose-6-phosphate-dehydrogenase was risen as compared with control group: at 1,7 times under ischemic heart disease, at 2,0 times under dilated cardiomyopathy, at 1,7 times under erythraemia and at 1,8 times under aplastic anemia. In erythrocytes of patients with iron-deficiency anemia the activity of enzyme was on the level of control group.

At the same time, the activity of glutation-reductase was risen also: at 2,0 times under ischemic heart disease, at 1,86 times under cardiomyopathy, at 1,8 times under erythraemia and aplastic anemia and at 22% under iron-deficiency anemia.

It is known, that glutatione is one from substrates to nitrosilation, that is connected with NO metabolism [9].

It has been shown, that in hemolysates of erythrocytes in the most groups of patients the content of low-molecular nitrosothiols (LMNT) was lowed as compared with control group: at 3,4 times under ischemic heart disease, at 1,9 times under cardiomyopathy, at 1,5 times under iron-deficiency anemia and at 25,5% under erythraemia. In erythrocytes of patients with aplastic anemia the change of LMNT content was on the level of tendency.

The obtained data evidence about adaptive character of biochemical changes in erythrocytes of patients and about connection these changes with type of pathology.

Keywords: erythrocytes, glucose-6-phosphate-dehydrogenase, glutation-reductase, low-molecular nitrosothiols (LMNT), glutatione, cardiovascular and haematological diseases.

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