

7th International Chronic Obstructive Pulmonary Disease Conference

October 22-23, 2018 | Rome, Italy

Functional activity of erythrocytes in patients with COPD

Muminov K P

Ministry of Health of the Republic of Uzbekistan, Uzbekistan

Aim: Assessment of the activity of the electron transport and oxygen transport systems of erythrocytes in patients with COPD.

Material & Methods: The study included a total of 150 patients with COPD. The average age was 47 ± 1.5 years. Patients were divided into three groups with COPD, by severity: 1G: Mild-54 patients, 2G: Moderate-59 patients, 3G: Severe-37 patients. The control group consisted of 20 healthy persons. In the hemolysate of erythrocytes, the content of cytochrome C, the activity of NADPH-cytochrome c-reductase, the concentration of cytochrome b5, the activity of NADPH-cytochrome b5-reductase, glucose-6-phosphate dehydrogenase (G-6-PD) and 2,3-diphosphoglycerate (2,3-DPG), cytochrome C content, Hb-oxyhemoglobin (HbO₂), deoxyhemoglobin (DHb), and methemoglobin (MtHb) using a pH potentiometer.

Results: The most significant decrease was observed in patients with COPD III degree of severity, a decrease in the level of cytochrome C, cytochrome b5 and enzyme G-6-PD by 34.5%, 27.6% and 22.8%, respectively, compared with the control group. This decrease in the level of cytochrome C, cytochrome b5 and the enzyme G-6-PD in erythrocytes occurred against the background of an increase in the activity of enzymes of the electron transport system-NADPH-cytochrome c-reductase, NADH-cytochrome b5-reductase in erythrocytes, and in the blood plasma of cytochrome C in comparison with the control group. High activity of NADH-cytochrome b5-reductase provides a sufficiently high pool of cytochrome b5, which exceeds the control values by 27.9% ($p < 0.002$). In the red blood cells of COPD patients with varying degrees of severity, decrease in HbO₂ content by an average of 22.6% ($P < 0.01$) and, conversely, an increase of DHb and MtHb by an average of 30% and 50%, respectively was observed. The content of 2, 3-DPG in the erythrocytes of patients with COPD was increased, and the activity of G-6-PD was reduced.

Conclusion: MtHb is an important indicator of the disruption of the activity of enzyme systems involved in oxidation and reduction processes. Among such enzymes, as mentioned above, are cytochrome C, cytochrome b5, NADPH-cytochrome c- and NADH-cytochrome b5-reductase, which has a direct function of the reduction of MtHb in HbO₂

muminov1963@mail.ru