

# **MODERN SCIENCE: PROBLEMS AND INNOVATIONS**

Abstracts of I International Scientific and Practical Conference

Stockholm, Sweden

5-7 April 2020

**Stockholm, Sweden**

**2020**

**UDC 001.1**

**BBK 57**

The 1<sup>st</sup> International scientific and practical conference “Modern science: problems and innovations” (April 5-7, 2020) SSPG Publish, Stockholm, Sweden. 2020. 749 p.

**ISBN 978-91-87224-07-2**

The recommended citation for this publication is:

*Ivanov I. Analysis of the phaunistic composition of Ukraine // Modern science: problems and innovations. Abstracts of the 1st International scientific and practical conference. SSPG Publish. Stockholm, Sweden. 2020. Pp. 21-27. URL: <http://sci-conf.com.ua>.*

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**CHANGES IN CARBON EXCHANGE IN PATIENTS WITH POST-  
OPERATING COGNITIVE DYSFUNCTION**

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The main blood cells involved in the transport of oxygen and carbon dioxide are erythrocytes [1-4, 8]. Basically, all factors that cause an increase in lactate content, as a rule, lead to an increase in the concentration of pyruvate in the blood, so lactate and pyruvate are recognized at the same time. Lactic acid (lactate) in the body is the end product of glycolysis (anaerobic oxidation of glucose) and glycogenolysis - the processes of glycogen oxidation. Lactate in energy exchange reactions is a metabolic "dead end" because lactate can further be converted into gluconeogenesis reactions. Lactate does not accumulate as a final product and maintains equilibrium with pyruvate. The lactate concentration may depend on the concentration of pyruvate, the intracellular redox state, pH. The effect of the cumulative effect of these factors determines the concentration of lactate, in particular under general anesthesia. Thus, under the conditions of thiopental anesthesia, the slowing of energy processes in brain tissue has been established [2, 6]. It is known that lactate is constantly formed in erythrocytes; the cerebral part of the kidneys, the retina, and in the liver and the bark of the kidneys is gluconeogenesis, where lactate is converted to glucose. At rest, the main source of plasma lactate - erythrocytes.

The purpose of this study is to determine the content of the major carbohydrate metabolism in patients with acute surgical pathology, depending on the age after administration to general anesthesia patients.

The study of 130 patients was conducted in surgical departments of different profiles at the Kharkov City Clinical Hospital for Emergency and Emergency Medical Services. prof. A.I. Meshchaninov. Surgery was performed under conditions of general multicomponent anesthesia with artificial ventilation using propofol and fentanyl, thiopental sodium and fentanyl.

The patients were divided into three groups, respectively: 1 group (n = 46) - young patients (18-43 years); mean age  $30.1 \pm 1.0$  years, 24 people, 22 women. Group 2 (n = 43) were middle-aged patients (44-59 years); mean age  $49.3 \pm 5.1$  years, 18 males, 25 females. Group 3 (n = 41) - elderly patients (60-80 years); mean age  $74.4 \pm 6.1$  years, 22 people, 19 women. According to the purpose and objectives of the study, the blood biochemical markers of carbohydrate metabolism - glucose, pyruvate and lactate content - were determined in patients' blood. Quantitative determination of the concentration of lactic acid in serum by the Buchner method [7]. The content of pyruvic acid in the serum was determined by Friedeman and Haugen [7].

Results of the study and their discussion. Thus, the researches made it possible to integrally evaluate the possible disorders of carbohydrate metabolism and to characterize the peculiarities of energy supply of the body to surgical patients in different periods of the disease depending on age.

Patients in the first age group -18-43 years have changes in carbohydrate metabolism immediately after surgery and anesthesia: a decrease in pyruvate on the background of hyperlactatemia and a significant decrease in the ratio of pyruvate to lactate (3.9 times). This indicates the switch of the aerobic glucose oxidation pathway to anaerobic, where the final product is lactate. This process helps to reduce the formation of a macroergic compound - ATP - the main source of energy in the body to ensure the processes of vital activity. However, the adaptive capacity of the young organism is more pronounced, compared to more age groups. A week after receiving anesthesia and surgery, the content of pyruvate increases and the lactate content decreases, the ratio increases by 2 times compared with these indicators in healthy people.

In patients of the second group - middle age - there are changes in the main monitoring indicators of carbohydrate metabolism, in all studies, depending on the periods of the disease, hyperglycemia is observed. On the first day after surgery, a decrease in pyruvate was observed on the background of hyperlactatemia, the ratio of pyruvate / lactate decreased by 2.54 times and 1.46 times, respectively, on the first day and after a week. The indicators do not change as much as in the 18-43 age groups, but they do not recover so quickly.

Elderly patients (60-80 years) have more pronounced hyperglycemia than other age groups. Hyperpyruvate and hyperlactatemia, the pyruvate / lactate ratio remains 2-fold and does not return to normal one month after surgery and anesthesia. Increasing the content of lactate and PVC indicates the development of an imbalance between the ratio of anaerobic and aerobic glucose oxidation processes and the disruption of energy supply against the depletion of adaptation mechanisms after anesthesia.

Conclusions. The absence of changes in the content of this indicator in the blood of patients of the young age group indicate that humoral mechanisms of regulation of the content of this monosaccharide, which is necessary for the energy supply of the processes of vital activity of the organism, are functioning at a sufficient level to ensure glucose homeostasis. Hyperglycemia in patients of this age group before surgery and in the first week after anesthesia and surgery may be caused by an increase in the blood stress hormones: adrenaline, cortisol. Regarding the monitoring of carbohydrate metabolism - blood glucose in elderly patients, they have hyperglycemia in all periods of the study. A month later, it practically returns to the values before surgery. However, studies of anaerobic glycolysis metabolites such as pyruvate and lactate in the serum of patients of different age groups revealed certain changes in these indicators, the severity of which was dependent on age and duration after anesthesia and surgery.

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