enzymes and prolonged stay in the wound, creates an optimal extracellular microenvironment for adhesion, migration and proliferation of cells of the epithelial tissues. The porous structure of the G-derm ensures the attachment and spreading of skin cells not only on the surface, but also deep down. At the same time, the cells retain their viability and synthetic activity, secreting the biological factors that are characteristic of them that regulate wound healing. Due to the gradual biodegradation, the wound covering with cellular material is integrated into the surrounding tissues without causing inflammatory and rejection reactions.

Thus, there is a wide range of cellular, biological and bioplastic materials for closing wound and skin defects of various localization. These materials vary in production method and scope. The main problem of using these drugs is the high cost and labor intensity of production. Currently, the most promising direction is the further development and study of complex materials based on the combination of technologies for the synthetic processing of natural polymers.

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Changes in the level of certain metabolites of carbohydrate metabolism children of school age living in the conditions of the plain of Dagestan

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doi: 10.18411/scienceconf-05-2019-24

idsp: scienceconf-05-2019-24

Abstract

The study of the features of metabolism in different age periods in children and adolescents, as well as depending on the climatic conditions, should include studies of the peculiarities of the chemical processes in various organs and systems. In addition, in the period of growth and development of children and adolescents, a necessary condition is the consistency of their internal biological processes. We conducted studies on the level of glucose, glycogen, lactate, and pyruvate in the blood of children and adolescents living in the conditions of the plain of Dagestan in the fall and spring at different age periods. The results of the study show that there is a certain regularity in the change in the level (concentration) of glucose, glycogen, pyruvate and lactate in the blood of children and adolescents in the studied age periods.

Key words: glucose, glycogen, lactate, pyruvate, children, adolescents, autumn, spring.

In the period of development of living organisms, including humans, the consistency of their internal biological processes is essential. This consistency is manifested in the rhythm of

physiological and biochemical processes and, in turn, is aimed at maintaining internal homeostasis, which ensures the optimal vital activity of a living organism in these conditions. The ability of a person, including in children and adolescents, to endure the effects of extreme situations largely depends on the individual characteristics of the organism, the rate of incorporation and the effectiveness of the activity of biochemical adaptation mechanisms in different age periods and in different climatic conditions. In addition, the metabolic processes that underlie all the functions of cells, tissues and the whole organism reveal genetically determined biological rhythms, ultimately reflecting the adaptation of the organism to changing environmental conditions.

The study of the metabolism of carbohydrates, lipids, proteins, nucleic acids during the period of growth and development of the child's body, children and adolescents should include studies of the characteristics of chemical processes in various organs and body systems, and in particular the dynamics of blood metabolism. Research in recent years has established a close relationship between the metabolic parameters of peripheral blood and the nature and level of development of the growing organism. In particular, changes in the cytochemical profile of blood in children and adolescents in various functional states are shown.

In connection with the above stated. The study of the biochemical aspects of the functioning of the body is essential, because during the growth and development of the body of children, adolescents and young people living in different climatic conditions, significant changes apparently occur not only in morphofunctional relationships, but also in the physiological and biochemical profile. It is the adaptation of the body of children and adolescents to different climatic conditions that largely depends on the state of not only lipid but also carbohydrate-protein metabolism.

However, research in this regard is practically solitary, and the experimental data obtained in this are sometimes contradictory.

Based on these prerequisites, we conducted studies on the level of some metabolites of carbohydrate metabolism in the blood of children and adolescents living in the conditions of the plain of Dagestan.

The object of research and experimental conditions.

The object of research were children and adolescents living on the plain of Dagestan (Makhachkala), at the age of 7; ten; 12; 15 and 18 years old. Studies were conducted in the fall and spring. For research in the age aspect, we selected 35 pupils on the principle of analogs (age, body weight, height and health).

Methods of biochemical analysis.

Preparation of tissue samples for analysis. Blood samples for analysis of carbohydrate metabolism metabolites (glucose, glycogen, galactose, lactic acid and pyruvate) were stabilized with heparin, immediately centrifuged, and the drained plasma was stored in the freezer of the refrigerator until analysis. All analyzes were performed in 3-4 folds (parallels).

The blood glucose level was determined by the glucose oxidase method modified by Abdulnatipov and Gazdarov (1977), the concentration of glycogen was determined by the Pflieger method (1963), the determination of pyruvate (pyruvic acid) was performed by the method of Frieleman Haugen (1963), the concentration of lactic acid was determined according to the generally accepted method.

Research results.

The research results show almost identical (unambiguous) changes in the concentration of glucose, glycogen, lactic acid and pyruvic acid in the study of age periods, as well as depending

Indicators	Age (years)				
	7	10	12	15	18
	M±m	M±m	M±m	M±m	M±m
Glucose mg %	80,1±2,3	94,3±1,7	101,6±2,5	110,1±3,7	118,1±3,3
	75,3±1,5	80,9±3,7	85,5±1,5	98,5±3,9	110,3±2,1
Glycogen mg/100мл	5,4±0,3	7,2±0,3	8,2±0,5	14,6±0,9	18,5±0,5
	4,7±0,01	6,7±0,1	8,0±0,3	14,3±0,3	18,0±0,3
Lactate, mg%	2,7±0,4	3,8±0,3	4,7±0,7	9,7±0,1	15,1±1,0
	2,4±0,5	3,3±0,4	4,0±0,4	9,00±0,3	14,5±0,5

Pyruvate, mg/100мл	0,16±0,03	0,19±0,02	0,25±0,01	0,60±0,03	0,71±0,1
	0,13±0,01	0,18±0,03	0,24±0,01	0,57±0,1	0,61±0,5

Note: in the numerator, indicators in the autumn, in the denominator - in the spring.

The concentration of glycogen in the blood of children and adolescents living in the conditions of the plain of Dagestan varies in the same way as glucose, but in quantitative terms its content is substantially less. The blood glycogen content in children aged 7 years was 5.4 ± 0.3 mg / 100 ml and 4.7 ± 0.01 mg / 100 ml, in the fall and spring, respectively. In subsequent age periods, there is almost the same age content of glycogen in the blood of children and adolescents. In particular, by the age of 18, the concentration of glycogen in the autumn period in adolescents (boys) is 18.5 ± 0.5 mg / 100ml, and in spring it was 18.0 ± 0.3 mg / 100ml. As shown by the results of a study to determine the content of glycogen in the blood of children and adolescents, in autumn and spring it is not the same, in all periods of the study, the concentration of glycogen in the blood in children and adolescents in the fall is slightly higher compared with the spring period (table).

The concentration of lactate (lactic acid) in the blood of children and adolescents varies almost more significantly in the studied age periods (table). With the growth and development of children and adolescents living in the conditions of the plain of Dagestan (Makhachkala), the lactate content in the blood almost evenly increases at the age of 18 is 15.1 ± 1.0 mg% and 14.5 ± 0.5 mg% in the autumn and spring, respectively. At the same time, at the age of 7 years, the concentration of lactic acid in the blood is 2.7 ± 0.4 mg% (autumn) and 2.4 ± 0.5 mg% (autumn), respectively. Therefore, research results show a significant increase in the content of lactic acid in the blood of children and adolescents from 7 to 18 years.

The level (content) of pyruvic acid in the blood of children and adolescents, as it grows and develops, changes (upwards) in the same way as lactic acid. At the same time, in quantitative terms, the content of pyruvic acid in the blood is significantly lower in comparison with lactic acid. The concentration of pyruvic acid in the blood of children aged 7 years is 0.16 ± 0.03 mg / 100 ml (autumn) and 0.13 ± 0.01 mg / 100 ml (spring). In subsequent age periods, the content of pyruvic acid increases, and at the age of 18 it was 0.71 ± 0.01 mg / 100 ml and 0.61 ± 0.5 mg / 100 ml in the fall and spring, respectively.

Based on the above stated study of the metabolism of carbohydrates, proteins and lipids based on the definition of intermediate metabolites, it seems to be essential in identifying certain patterns of metabolic processes occurring in the body of children and adolescents. Blood concentrations in children and adolescents of glucose, glycogen, lactic acid, as well as pyruvic acid, etc. obviously depends on many factors, including the climatic conditions where they live. Currently, it is an established fact that when a person adapts to certain living conditions, all types of metabolism of proteins, carbohydrates, fats, nucleic acids, macro- and microelements, etc., are reorganized. It was established that when children, adolescents and young people adapt, the body moves to a qualitatively new level of homeostasis, etc. (3,5,6). In addition, numerous studies by Gazdarov and his staff (1989–1997), Abdulnatipov (1991–1995) show various changes in metabolic processes in the body from an early age to aging.

Analyzing the obtained data on the determination of glucose, glycogen, pyruvate, blood lactate in children and adolescents of Dagestan living in the conditions of the plain (Makhachkala), certain regular changes of these metabolites were revealed in the studied age periods that are of no small importance both in scientific and in applied relations.

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The influence of surgical revascularization on diastolic function in patients with diabetes mellitus type 2

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doi: 10.18411/scienceconf-05-2019-25

idsp: scienceconf-05-2019-25

Abstract

The study included 122 patients diagnosed with coronary artery disease who received comprehensive treatment. The diagnosis of coronary artery disease was confirmed on the basis of anamnesis, complaints, objective and instrumental methods of research. Among the instrumental methods of research selective coronarography occupied the main role. All patients underwent coronary artery bypass grafting (CABG). The studied patients were divided into two groups: Group 1 - 52 patients with coronary artery disease CHD without diabetes; 2nd group - 70 patients with coronary artery disease CHD and type 2 diabetes. Of the 52 patients without diabetes, 29 patients received β -blockers (metoprolol 12.5–25 mg twice a day), and 23 patients a specific selective If-channel inhibitor — ivabradine (5–7.5 mg twice a day).

Left ventricular diastolic dysfunction (LVDD) (85.7%) are more common in patients with type 2 diabetes than in patients without diabetes (65.3%). The results of echocardiographic studies performed at different stages of surgical revascularization showed that LVDD was partially reversible in both groups.

Revascularization leads to a decrease in the degree of DD, to reduce the number of patients with LVDD and does not depend on the drugs selected for heart rate control.

Key words: cardiovascular diseases, heart rate, diastolic function, type 2 diabetes, ivabradine, β -blockers, surgical revascularization

Диастолическая дисфункция левого желудочка (ДДЛЖ) является одним из самых ранних осложнений диабета у 50-75% пациентов с диабетом 2 типа (СД типа 2) – 50-75% даже без ИБС [1]. Многочисленные эпидемиологические исследования показали, что существует корреляция между частотой сердечных сокращений (ЧСС) и сердечно-сосудистых заболеваний (ССЗ), а также смертностью, связанной с ними [2,3,4].

Цель исследования- изучение влияния контроля ЧСС и хирургической реваскуляризации на диастолическую функцию у пациентов СД типа 2 с сохраненной систолической функцией левого желудочка.

Материалы и методы. В исследование было включено 122 пациента с диагнозом ИБС, которые получали полноценное лечение. База сбора данных-Центральная Больница Нефтяников. Диагноз ИБС был подтвержден на основании анамнеза, жалоб, объективных и инструментальных методов исследования. Среди инструментальных методов исследования - селективная коронарография занимала основную роль.

Всем пациентам выполнено аортокоронарное шунтирование (АКШ). Показаниями к АКШ являлись выраженные атеросклеротические стенозы коронарных артерий, подтвержденные данными селективной коронарографии.