

25, $9 \pm 1,9$ years. Compared with boys, girls of both groups had a slower aging rate: in the control group at an average actual age of $19,5 \pm 0,4$ years, their biological age reached $28,6 \pm 1,6$ years. At the same time, in girls from the experimental group at an average age of $19,5 \pm 0,5$ years, the biological age was $24,0 \pm 1,3$ years ($P < 0,05$).

The evaluation of the aging rate of students showed that in neither of the groups there were students with a distinct slow aging rate (the difference is from -15 to -10), whereas only boys and girls from the experimental group – 9 % and 16 %, respectively, had a slow aging rate (the difference is from $-8,9$ to -3). 53 % of the experimental group members have their approximate biological age, which is two times more than in the control group. Needless to say that the main part of the students of the control group (61 % of boys and 47 % girls) show a distinctively rapid aging rate, while in the experimental group this is observed in 36% of young men and 21 % of girls.

Thus, the study showed signs of premature aging in all studied groups of students. At the same time, the indicators of the biological age of students depend on the level of regular weekly physical activity.

PROGNOSTIC SIGNIFICANCE OF MOLECULAR PROFILING OF COLORECTAL CANCER

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In the course of the study there were determined the levels of expression of TP and TS genes, characterizing tumor sensitivity to drug treatment in patients with colorectal cancer.

Keywords: colorectal cancer, level of expression, tumor sensitivity, disease prognosis.

The issue of the day of modern oncology and proctology is a colorectal cancer (CRC), the increase of morbidity of which is related to a great extent with worsening of ecological situation in the Republic of Belarus. One of the modern approaches to choosing an individual program for treating patients with malignant neoplasms and predicting the course of the disease is the study of molecular-biological markers in tumor tissue. The determination of these markers in the tumor can provide additional information about the biological behavior of the tumor: its rate of growth, the ability to invade and metastasize, and resistance to chemotherapy drugs [1].

Thymidylphosphorylase (TP) is an angiogenesis factor – increased expression of this enzyme is associated with an unfavorable prognosis of the course of the disease [2]. Elevated levels of thymidylatesynthetase (TS) of colorectal cancer are associated with worse prognosis and resistance to chemotherapy [3].

Materials and methods. The material for the study was the data on 50 patients suffering from colorectal cancer who received treatment at the "Republican Scientific and Practical Center of Oncology and Medical Radiology. N. N. Alexandrov" from 2014 to 2016 years.

In the course of the work performed, patients with colorectal cancer were assessed for expression levels of TP and TS genes by real-time PCR using the Bio-Rad iQ5 (USA) amplifier.

In the course of the study, the overexpression of the TP gene was 6,90 r.u., the hypoexpression was 0,94 r. u. As a result of the studies, the elevated level of expression of the TS gene was 2,01 r. u., the low level of expression was 1,54 r. u.

Hyperexpression of the TP gene was observed in 40 % of patients, a low level of expression was found in 54 % of patients. In the group of patients with recurrent disease, moderate expression was observed in 66,8 % of cases, without recurrence – in 33,2 % of cases.

The high level of expression of the TP gene characterizes the sensitivity of the tumor to the preparations of the fluoropyrimidine series and indicates a favorable prognosis of the course of the disease.

Hyperexpression of the TS gene was detected in 56 % of patients, a low level of expression was observed in 38 % of patients. In the group of patients with recurrent disease, overexpression was observed in 83,4 %, without recurrence – in 26,6 % of cases.

High levels of TS gene expression in 83,4 % of patients indicate tumor resistance to drug therapy using 5-fluorouracil and tomudex and a high risk of recurrence of the disease.

Thus, high levels of TP gene expression in 40 % of patients and low levels of TS gene expression in 38 % of patients indicate the sensitivity of the tumor to ongoing drug therapy and favorable course of the disease.

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GLUCOSE LEVEL CHANGES IN PATIENTS WITH DIABETES MELLITUS AND IN HEALTHY INDIVIDUALS UNDER THE INFLUENCE OF LOW-LEVEL LASER THERAPY

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This research is devoted to the study of changes in glucose levels in patients with diabetes mellitus and in healthy individuals under the influence of low-level laser therapy (LLLТ). It is shown that LLLТ is an important component of therapy in the treatment of type 2 diabetes, since it favorably affects the biochemical parameters of blood and increases the resistance of the organism to unfavorable factors.

Keywords: diabetes mellitus, hyperglycemia, low-level laser therapy.

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. Diabetes is characterized by a chronic hyperglycemic condition resulting from insufficient action of insulin [1]. The main complications of this disease are damage to kidney, blood vessels and eyesight, nervous system disturbance. Abovementioned complications may lead to disability, therefore the search for new ways of treatment and reduction of complications threat level are relevant objectives at the moment. In this regard the top-priority is the choice of treatment which has a many-sided effect on the human body. One of these methods is the low-level laser therapy (LLLТ).

Low intensity laser therapy is referred to electromagnetic radiation of optical range. The helium-neon laser radiation has a low radiant power – up to 20 mW with a wavelength equal to 630 nm capable of affecting trigger mechanisms of cellular regulation, changing cell membrane condition by the increase of cell functional activity, changing of metabolic processes, stimulating of microcirculation and oxidation-reduction processes, as well as increasing the human body tolerance. At the same time laser radiation has not so many contraindications, which include eidosyncrasy, febricity, presence of benign or malignant tumors.

Currently there is no consensus on laser impact on the human body, its separate systems and abnormal focus. It is assumed that the variability and systematic nature of secondary biochemical and physiological effects of LLLТ on blood is explained by the variety of photoacceptors and primary photobiological reactions implemented on different levels. Laser interaction with a biological object includes the following stages: light quantum absorption and intramolecular energy redistribution (photophysical processes), an intermolecular energy transfer and primary photochemical reactions, biochemical processes involving photoproducts, secondary photobiological reactions and the body's general physiological response to the effect of light [2].

To study the effect of LLLТ on blood glucose values, 32 patients were included in this study. Group I included the patients who didn't have type 2 diabetes – 16 people (50 %) of the average age of $50,18 \pm 8,4$ years. The second group consisted of patients with type 2 diabetes of the average age of $56,87 \pm 6,83$ years. Serum samples of venous blood were analyzed before and after the effects of LLLТ in healthy individuals and in patients with type 2 diabetes.

Statistical analysis was performed using the R programming language and Microsoft Excel table processor. Varying quantitative indicators of the results of the studies were subjected to statistical treatment, with an assessment of the reliability of the effects using Student's t-test. The difference was considered to be reliable for $p \leq 0,05$ [3].

In patients with type 2 diabetes after LLLТ use, the blood glucose level was reliably reduced ($p = 0,028$), the baseline level was $7,715 \pm 2,23$, the post-procedure glucose level was $6,78 \pm 1,39$. Accordingly, in healthy patients such differences in the level of glucose before and after the effects of LLLТ was not observed and corresponded to the value ($p = 0,76$). Thus, one can draw a conclusion about the favorable effect of the procedure on the body of patients with type 2 diabetes.