morphological and functional changes in the liver, and their mechanisms in the offspring of rats prenatally exposed to prolonged stress are still not fully clarified; the significance of these changes for the state of other organs and the body as a whole in animals, as well as the health of their offspring, the real threat of persistent metabolic disorders and chronic liver disease development in rats at a mature age. The solution of these issues at the level of experimental studies is extremely important in order to deepen the knowledge of the mechanisms of pathogenesis of organ damage being under conditions of chronic stress in adults and children, necessary to optimize the methods of prevention and treatment of liver diseases.

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Key words: *liver, pregnant rats, offspring, immobilization stress, experiment.*

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REGULATORY ACTION OF NATURAL BIOADDITIVE CONTAINING SELENIUM ON THYROID FUNCTION

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Selenium is an important element with antioxidant properties that protects us from malignant diseases, helps maintain tissue elasticity, regenerates heart muscle, regulates heart rhythm, maintains pancreas function and, in particular, thyroid gland by including it in responsible enzymes for conversion of thyroxine into triiodothyronine [1]. As a component of glutathione peroxidase (GSH-Px), selenium belongs to the first and second levels of antioxidant protection of the cell. Selenium is a component of the deiodinase enzymes that convert T4 to T3. Thyroxine (T4) is the main hormone secreted by the thyroid gland that plays an important role in the hypothalamo-pituitary regulating thyroid system and has an influence on general metabolism. Serum concentration of T3 (triiodothyronine) reflects more the functional status of the peripheral tissues than the secretory performance of the thyroid gland [1]. It is known the ability of cyanobacterium *Spirulina platensis* to bioconvert inorganic selenium into organic by including it in amino acids - cysteine and methionine, substituting sulfur to obtain Se-cysteine and Se-methionine, as well as incorporation in other compounds (proteins, polysaccharides, lipids [2,3]. In previous research the influence of an aqueous phytoextract SNCM-4 in regulation of the level of hormones T3 and T4 in hypothyroidism in rats has been studied [4]. The composition of the phytopreparation is described in the research conducted by A. Crivoi et al. [5]. The aim of the present research was to study effect of natural bioaditive, containing selenium obtained in the base of spirulina biomass on thyroid function.

Materials and Methods. Supplementation of the biopreparations was performed for 50 ml infusion per rat for 24 hours, 20-40 days. The experimental studies were performed on white laboratory rats with body mass 220-250 g divided into 4 groups: one control and three experimental. Induction of hypothyroidism was achieved by administering of aqueous KSCN suspension (20mg / 100g body weight). At the end of this period, the level of T3 and T4 in blood was determined in 4 groups of rats: control group, group with cyanide supplementation, 2 groups with bioadditive supplementation: phytoextract SNCM-4 or Se-containing bioadditive with and without tiocyanate addition.

Results. According to the results of Se-bioadditive supplementation to rats for 20 days, an obvious action on the functional state of the thyroid was observed, which is expressed by a tendency to normalize the thyroid hormone status. Thus, an increase in the level of the hormone T4 (14.47nmol / g) in group 4 was observed, upon the addition of selenium dietary additive in concomitant ration with KSCN and, which diminishes the effect of thiocyanate ion (SCN^-), compared with the experimental group 2 (11.3 nmol / g), in which only KSCN was administered. The value of the T4 hormone was increased in group 3 (17.79nmol / l), where only the dietary bioadditive was supplemented, compared to the control group (15.57nmol / l). Thus natural Se-bioadditive supplementation effect consists in increased thyroid tissue protection. Similar effects are observed in the case of SNCM-4 phytoextract supplementation, but the given effect was observed in phytoextract supplementation for a longer period (40 days) compared to the Se-bioadditive (20days) (Tab.1). .

Table 1. Hormone T3 and T4 levels after bioadditive supplementation

Bioadditive	Hormone T3 level, nmol/g				Hormone T4 level, nmol/g			
	Lot 1	Lot 2	Lot 3	Lot 4	Lot 1	Lot 2	Lot 3	Lot 4
Phytoextract SNCM-4 supplemented 40 days	1.43 100%	2.22 155.2%	1.35 94.4%	2.04 142.7%	15.07 100%	11.11 73.7%	16.89 112.1%	14.21 94.3
Se-containing bioaditive supplemented 20 days	1.50 100%	2.42 160.9%	1.58 109.7%)	2.20 152.2%	15.57 100%	11.30 79.6%	17.89 114.7%	14.47 92.7%

The serum concentration of T3 reflects more the functional status of the peripheral tissues than the secretory performance of the thyroid gland. This explains the increase in the level of T3 in the case of hypothyroidism model (KSCN supplementation), but this increase is temporary and occurs until the secretory depletion of T4. At the concomitant supplementation of the Se-bioadditive and KSCN, the quantitative values of the hormone T3 are decreased by 0.22 nmol compared to group 2 with modeled hypothyroidism. This fact confirms the obvious action of s Se-bioadditive on the functional status of the thyroid, which is expressed by the tendency to normalize the thyroid hormone status.

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Key words: *Spirulina platensis, selenium containing bioadditive, thyroxine, triiodothyronine*

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LABORATORY CONTROL OF IMMUNE-INFLAMMATORY AND ENDOTHELIAL DYSFUNCTION MARKERS IN PATIENTS WITH ISCHEMIC HEART DISEASE ON THE BACKGROUND OF HYPOTHYROIDISM

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Cardiovascular pathology is the main cause of morbidity, disability and mortality in the Ukrainian population. Among the European countries, Ukraine is among the first places in the mortality rate of the population from ischemic heart disease (IHD) [1]. IHD, along with the traditional risk factors and associated illnesses, in particular endocrine diseases, where hypothyroidism occupies one of the leading places, is strongly influenced by related diseases [2]. Today, thyroid disease and hypothyroidism syndrome are the most common endocrine pathology after type 2 diabetes. Thyroid function has a complex relation with various contributors to atherogenesis. In the pathogenesis of IHD, in the context of hypothyroidism, we should pay particular attention to inflammatory factors and factors of endothelial dysfunction that have proinflammatory and atherogenic effects and complicate the course of IHD [3]. Improving diagnosis and developing new approaches to the treatment of IHD has great social and medical significance.

Material and Methods. The study comprised 42 patients who were on inpatient treatment in the endocrinology department of the Kharkiv city clinical hospital № 2 named after prof. A.A. Shalimov. All patients were diagnosed and verified (documented) to have stable angina pectoris (NYHA classes II-III), and 21 patients (the first group) who had IHD on the background of hypothyroidism, which was confirmed by ultrasound scanning and laboratory examinations. Group 2 included 21 patients with IHD without structural and functional changes of the thyroid gland. The age of patients was from 52 to 75 years (average age 61.4±1.25). The control group consisted of 15 practically healthy persons of the same age. The patients underwent standard clinical examination and got the determination of the levels of tumor necrosis factor-a (TNFa), C-reactive protein (CRP), endothelin-1 (ET-1), plasminogen activator inhibitor-1 (PAI-1), neopterin using standard reagent kits (Vector-Best, Russia; Biomedica, Austria; Biomerica, USA) by the enzyme-linked immunosorbent assay (ELISA). Thyroid-stimulating hormone (TSH) and free thyroxine (free T4) levels were determined using the chemiluminescence immunoassay (CLIA). All of the provided reagents were used in accordance with analysis manual added to the kits. The reliability of the differences between the mean values was determined using Student's t-test. The difference was considered statistically significant at the probability level of $p < 0.05$.

Results. Having analyzed the obtained results we found a significant ($p < 0.05$) increase in the level of the PAI-1 in the group of patients with IHD with hypothyroidism in comparison with healthy subjects (by 89.25%) and with patients with IHD without structural and functional changes in the thyroid gland (by 67.94%). The comparative analysis also showed a significantly higher ET-1 level in comparison with healthy subjects (by 2.9 times) and patients with IHD without thyroid disease (by 1.3 times) ($p < 0.05$). The patients with IHD with hypothyroidism had the levels of neopterin, TNFa and CRP