THE ROLE OF DIETARY SUPPLEMENT OYOX IN THE NORMALISATION OF METABOLIC PROCESSES IN THE BODY

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Abstract: Disorders of metabolism (metabolism) are manifested at almost all levels of the biological systems of the body - at the cellular, molecular and others. Metabolic disorders lead to the development of various diseases, in particular, to homeostasis disorders, atherosclerosis, coronary heart disease, strokes and myocardial infarction. The role of MS in the development of infertility is increasing. The main way to normalize metabolic processes is the widespread use of dietary supplements in everyday practice. The aim of the research is to study the role of the dietary supplement OYOX in the normalization of metabolic processes in the body. Materials and methods. We used theoretical and practical research methods. In particular, the methods of analysis of literary sources, statistical data, results of clinical and preclinical studies were used. The method of generalization, analysis, systematization, classification of the obtained data was used. From the practical methods, we analyzed anamnestic data, interpreted the results of biochemical and clinical blood tests before and after taking the drug. Results and discussion. It is proved that the drug OYOX has a positive effect on the indicators of metabolic processes. This is confirmed by the results of biochemical and clinical studies. There is a significantly significant decrease in cholesterol levels, primarily due to a decrease in HDL levels, as well as a decrease in triglyceride levels. According to the results of clinical studies, the drug OYOX helps to normalize the level of glycated hemoglobin and erythrocytes, there is an increase in the number of stab and segmented neutrophils, the level of eosinophils does not change. Conclusions. Dietary supplement OYOX can be effectively used to normalize metabolic processes, eliminate metabolic syndrome.

Key words: metabolic disorders, metabolic syndrome, dietary supplements, OYOX, clinical analyzes, biochemistry.

1 Introduction

Relevance of the topic. A pandemic of metabolic syndrome (MS) disorders associated with metabolic disorders is acquiring not only medical, but also increasing social significance. This condition has adverse effects on the entire body and is a risk factor for serious illness (Tao et al., 2011). MS is characterized by an increase in visceral fat mass, decreased sensitivity of peripheral tissues to insulin and hyperinsulinemia, impaired carbohydrate, lipid, and purine metabolism, and arterial hypertension. The main manifestation of MS is abdominal obesity. Currently, there are at least 7 alternative definitions of MS in the world.

According to the clinical guidelines of the Russian Medical Society for Arterial Hypertension (2013), the presence of MS is determined if there are 3 criteria: 1 main and 2 additional. The main criterion for MS in women is a waist circumference of more than 80 cm (Ametov, 2013).

Additional criteria: increased blood pressure or treatment with antihypertensive drugs, increased triglycerides, low-density lipoprotein cholesterol, decreased high-density lipoprotein cholesterol, impaired glucose tolerance and / or impaired fasting glycemia. The prevalence of MS in Russia varies from 20 to 35%, and in women it occurs 2.5 times more often, and the number of patients increases with age (Yoshino et al., 2011).
The mechanisms of development of obesity and MS continue to be actively studied. The role of genetic and epigenetic conditioning of insulin resistance as one of the leading pathogenetic factors of MS is studied. It has been found that insulin sensitivity decreases with increasing body fat. MS is characterized by the development of slowly progressive inflammation, and many patients have increased levels of proinflammatory cytokines (Bekmukhambetov et al., 2015).

Research problem. Restriction of physical activity, decreased physical activity, increased caloric intake, overeating, excessive use of salt, alcohol, fast food invariably lead to metabolic disorders and the development of metabolic syndrome (Belozerova & Kobozeva, 2014; Butrova, 2014; Chahirou et al., 2018). One of the effective ways to correct metabolic disorders in the body is the intake of dietary supplements, in particular, OYOX supplements.

2 Goals and Objectives

The aim of the research is to study the role of the dietary supplement OYOX in the normalization of metabolic processes in the body.

Research objectives

1. Consider the features of metabolic disorders in the body.
2. Consider the main ways of correcting metabolic disorders.
3. To analyze the effect of the OYOX preparation on the state of the basic biochemical and clinical parameters of the organism.

3 Methods and Materials

We used theoretical and practical research methods. In particular, the methods of analysis of literary sources, statistical data, results of clinical and preclinical studies were used. The method of generalization, analysis, systematization, classification of the obtained data was used. From the practical methods, we analyzed anamnestic data, interpreted the results of biochemical and clinical blood tests before and after taking the drug.

4 Results and Discussion

Characteristics of metabolic disorders (metabolic syndrome). Metabolic syndrome is a complex of changes associated with metabolic disorders. The hormone insulin ceases to be perceived by cells and does not perform its functions. In this case, insulin resistance or insensitivity to insulin develops, which leads to impaired absorption of glucose by cells, as well as pathological changes in all systems and tissues. It is known that MS is a precursor of factors in the development of many diseases, such as diabetes mellitus, arterial hypertension, IHD, diseases of the stomach, duodenum, liver, gall bladder, and pancreas (Shashel & Kaspirovich, 2012).

There is still no consensus regarding the main pathogenetic factor of MS, which determines all other manifestations, however, most researchers believe that the key link in MS is abdominal obesity with the subsequent development of IR in individuals with a genetic predisposition to the disease, manifested in the presence of similar environmental factors.

Also, IR and obesity contribute to the manifestation and progression of each other and other components of MS. The predisposition to the development of IR and obesity is a consequence of the presence of the “thrifty genotype” - a complex of certain genes that ensure the survival of the organism in unfavorable food conditions. In the process of evolution, genes are fixed, which, with excess nutrition, are responsible for the accumulation of energetically rich substances in adipose tissue and reduced energy utilization. In conditions of insufficient supply of nutrients, the body uses these reserves. However, in modern conditions, when a person moves little and consumes a large amount of high-calorie food, the “thrifty genotype” contributes to the development of obesity and IR. Insulin resistance - a decrease in the response of insulin-sensitive tissues to insulin at a sufficient concentration, leading to chronic compensatory GI (Kennedy et al., 2015).

A special role in the development of MS is played by VT, which is sensitive to the action of insulin and is one of the main

regulators of metabolism. Its excessive development, arising from hyperplasia and / or hypertrophy of its constituent cells, first leads to the development of obesity, and then IR. All VT cells are derivatives of loose connective tissue (PCT). An increase in the number of cells occurs due to an increase in the mitotic activity of their precursors; mature VT cells do not divide. In the human body, the development of white fat is observed at the 14th week of pregnancy, although the exact timing depends on the size of the fetus: the larger the fetus, the earlier adipocytes develop. Proliferation of progenitor cells decreases at the end of pregnancy, and then VT increases primarily due to pre-differentiated ones, the division of which stops in adolescence. Thus, the total number of adipocytes does not change further, despite the fact that new cells will be formed and destroyed. Similarly, about 10% of human adipocytes are renewed per year (Butrova, 2014).

Fat cells absorb and deposit FAs in the form of TGs, release them into the intercellular medium in the form of FFAs for absorption by all cells in vivo. FAs in the human body are present in bound and free forms. The bound form is esterified FA in the form of ether compounds with alcohols (glycerol, cholesterol, etc.) in the composition of TG, phospholipids and steroids, accounting for 90–95% of the total FA. Free, or non-esterified, fatty acids (NEFA, or FFA) make up 5-10%, in blood plasma they are associated with albumin. A very small part of plasma FFAs is formed during hydrolysis of LP (chylomicrons, very low density lipoproteins (VLDL)) under the action of endothelial LPL or hepatic lipase, while the bulk of them comes from VT as a result of TG lipolysis with the participation of hormone-sensitive lipase (Misnikova, 2015).

Thus, TGs of fat stores play the same role in lipid metabolism as liver glycogen in carbohydrate metabolism, and FFAs in origin and physiological role resemble glucose, which is formed during the breakdown of glycogen. When adipocytes are filled with TG, their proliferation increases for further FA deposition. Excessive accumulation of stored TGs in adipocytes can lead to dysfunction of EPS with the development of endoplasmic stress syndrome: deformation of rough membranes of EPS leads to the absence of formation of tertiary and quaternary protein structures, which is accompanied by the secretion of functionally inactive proteins.

An increase in the concentration of non-physiological proteins in adipocytes disrupts the function of these cells, but the accumulation of TG in them continues. If the fat cells become very large, then the program of cell death by the type of apoptosis is implemented, and apoptotic bodies in large numbers are endogenous phlogogens. Therefore, the death of hypertrophied adipocytes leads to the development of inflammation without an increase in the number of cells in the VT (Moskalev, 2013).

Metabolic Syndrome (MS) is an eyelid disease associated with errors in nutrition and a sedentary lifestyle. It is characterized by the following symptoms: abdominal obesity, insulin resistance, increased glucose and lipid levels, and increased blood pressure. In addition to the obvious lifestyle reasons, genetic factors also contribute to the development of MS. Genome-wide association analysis (GWA) studies, such as the GIANT consortium (Genetic Investigation of ANtropometric Traits), which included 270,000 Europeans, have identified specific polymorphic variants of genes that are highly likely to affect body mass index (Ametov, 2013).). The presence of a genetically determined propensity to overweight or the carriage of polymorphic variants of MS susceptibility genes are certain indicators of the risk of developing these conditions.

Metabolic disorders (metabolism) are manifested at almost all levels of the biological systems of the body - at the cellular, molecular and others. The most serious metabolic disorder is considered at the cellular level, since it significantly changes the mechanisms of self-regulation and has a hereditary cause. Metabolism is a complex of chemical reactions that fully correspond to its name, because metabolism in Greek means "transformation" (Isaeva et al., 2017).

Constantly acting metabolism, in fact, supports life in the human body, allowing it to develop and multiply, adequately respond to the effects of the external environment and maintain all its functions. Fats, carbohydrates, proteins and other elements take part in metabolism, each of which plays its own role in metabolism.

- An irreplaceable “building material” is proteins. Proteins are part of the structure of blood plasma, hemoglobin, hormones, cytoplasm, immune cells, and proteins are also responsible for the water-salt balance and fermentation processes.
- Carbohydrates are considered a source of energy resources of the body, among the most important are glycogen and glucose. Also, carbohydrates are involved in the synthesis of amino acids, lipids.
- Fats accumulate energy reserves and release energy only in combination with carbohydrates. Fats are also needed for the production of hormones, the assimilation of certain vitamins, they are involved in the construction of the cell membrane, ensure the preservation of nutrients (Kim et al., 2011).

A metabolic disorder is a change in one of the metabolic stages - in catabolism or anabolism. Catabolism or dissimilation is the process of oxidation or differentiation of complex elements to the state of simple organic molecules that can participate in the process of anabolism (assimilation) - synthesis, which is characterized by energy consumption. Overweight in many people occurs due to the peculiarities of eating behavior: late satiety, tendency to overeat, early onset of hunger, tendency to frequent snacks, and others (http://cardioweb.ru; Romantsova et al., 2012).

Nutritional satiation - the disappearance of hunger after eating, refusal to continue eating. The saturation rate depends on both mechanical (stretching, stomach) and neuroendocrine (release of active substances that affect the saturation center in the brain) factors. Polymorphism of genes that influence these neuroendocrine responses can lead to changes in the concentration and activity of encoded proteins, and thus affect the rate of onset of satiety (Koh et al., 2017).

In persons with MS, according to echoencephalography, psychological tests, there are clear signs of a stress state (Kennedy et al., 2015). The hypothalamic-pituitary system in a stressful situation is characterized by increased activity. The level of hormones - adrenocorticotropic hormone (ACTH), glucocorticoids, follicle-stimulating hormone (FSH), estrogens, growth hormone (STH), insulin - increases (Kennedy et al., 2015; Kim et al., 2011; http://cardioweb.ru). An increase in the amount of steroid hormones contributes to the contrainsular effect. Weight gain progresses, there is a tendency to hypertension, menstrual function, hemostasis are disturbed, the risk of heart attacks and thrombosis increases. In women, against the background of menstrual dysfunction, hyperplastic processes develop in the endometrium, myometrium, and mammary glands (Moskalev, 2013).

Obesity and MS are a multidisciplinary medical problem. Reproductive dysfunctions are especially relevant in metabolic dysfunctions. It can be assumed that for the occurrence of this pathology, a period of 4–5 years is required, after which the conditionally functional changes become anatomical. Obesity with menstrual dysfunction and infertility is the most common type of MS (Moskalev, 2013).

In recent decades, there has been a steady increase in various types of neuroendocrine disruptions in women with metabolic disorders, leading to impaired fertility. Bekmukhambetov E.Zh. (2015) investigated the consequences of maternal overeating during pregnancy, accompanied by an increase in the incidence of obesity and metabolic diseases in future children. Maternal

and paternal obesity before conception alters the molecular composition of oocytes and sperm, leading to epigenetic reprogramming of fertilization, altering the trajectory of the embryonic development process, increasing the prevalence of obesity and metabolic disorders in future offspring (Andrianova et al., 2015).

Also, in clinical practice, diseases are described in detail, which are inevitably accompanied by signs of metabolic disorders:

- Gout is a dysregulation of uric acid metabolism, in which salts accumulate in the kidneys and cartilaginous tissues, provoking an inflammatory process.
- Hypercholesterolemia - disorders of dissimilation, catabolism of lipoproteins, when the level of cholesterol in the blood rises significantly, cholesterol also accumulates in the tissues. This imbalance is one of the reasons for the rapidly developing cardiovascular diseases worldwide.
- Phenylketonuria - metabolic disorders of hereditary etiology, when the body lacks a specific enzyme - phenylalanine hydroxylase, which leads to mental disorders (developmental delay).
- Gierke's disease - an excess of glycogen in organs and tissues, which leads to hepatomegaly (enlargement of the liver), developmental delay - in growth, hypoglycemia.
- Alcaptonuria - metabolic disorder due to gene mutation, when the gene responsible for the synthesis of oxidase does not perform its function. This is a typically male disease that affects the cartilage tissue (spine, joints).
- Albinism - lack of the necessary pigment - melanin. The disease is caused by the inability to synthesize tyrosine and phenylalanine and has a hereditary etiology. In addition to these diseases, signs of metabolic disorders are characteristic of many other pathologies, usually developing genetic deformities (Misnikova, 2015).

Ways to correct metabolic disorders. Recent studies have demonstrated the high effectiveness of diet and physical activity in correcting metabolic disorders. With a change in lifestyle in people with early metabolic disorders, the risk of type 2 diabetes mellitus (type 2 diabetes) decreases by 58%, the risk of obesity decreases by 48% (Simonsen et al., 2018). However, it is also known that in a number of patients, diet and increased physical activity are ineffective and do not prevent the development of the disease. Today, a new approach to building a diet based on the individual characteristics of a person is proposed. The influence of nutritional components on gene expression is being studied by a new science - nutrigenomics. Nutrients can cause changes in metabolism by affecting the activity of certain genes, which in turn affect the human proteome and metabolome. In addition, the genetic variability of the food itself can have an impact on human health (Misnikova, 2015).

Determination of genetic markers affecting lipid metabolism makes it possible to assess the individual risk of hyperlipidemia (increased levels of LDL cholesterol and triglycerides), which underlies atherosclerosis and ischemic heart disease. In addition, impaired absorption, distribution and mobilization of fatty acids from adipocytes affect the risk of overweight and the need to restrict fat to a certain class. There are several types of fats: saturated, polyunsaturated, monounsaturated, and hydrogenated fats (trans fats). One of the main methods of weight loss in MS patients is the use of a low-fat diet (Kim et al., 2011). The goal of low-fat diets is to reduce your intake of fatty foods and replace them with low-fat ones. Eating a low-fat diet reduces the risk of heart disease, liver disease, and kidney disease. However, a sharp restriction of fat for a long time can have adverse consequences: a deficiency of vitamins A, D, K, E, which leads to physical and mental fatigue, dry skin, hair loss and other disorders (Koh et al., 2017).

In studies recently conducted by the Institute of Nutrition of the Russian Academy of Medical Sciences, the following violations of the nutritional status of the Russian population were established: excessive consumption of fats; deficiency of polyunsaturated fatty acids; deficiency of complete proteins; deficiency of most vitamins; deficiency of minerals - calcium, iron; deficiency of trace elements - iodine, selenium, zinc, fluorine (Bekmukhambetov et al., 2015). The fastest, economically acceptable and scientifically grounded way of solving this problem is the creation and widespread use of dietary supplements in everyday nutrition. At their core, dietary supplements are micronutrients in compact and easy-to-use forms. Therefore, today, a promising direction is the use of biologically active additives (dietary supplements) for the treatment and prevention of metabolic disorders.

Biologically active food additives (BAA), nutraceuticals and parapharmaceuticals, occupy an intermediate position between drugs and food. BAA can be successfully used to saturate the body with food biologically active substances, the deficiency of which is often found in modern humans. Today dietary supplements can be considered as a real means for chemoprophylaxis of metabolic disorders and pathological processes associated with this state. Examples of dietary supplements are given, in which special studies have shown the ability to prevent the development of malignant tumors and atherosclerosis (Nogalska & Pankiewicz, 2016).

One of the effective means of normalizing metabolic processes is the orthomolecular drug OYOX.

The core of the OYOX composition is the key complex molecule "CYC-8" containing cycloastragenol. "CYC-8" -produced by treatment with a weak combined magnetic field (CMF) tuned in the parametric resonance mode, which led to the discovery of a number of new previously inaccessible properties of cycloastragenol. Formulated ingredients such as resveratrol, 5NTP, phosphatidylserine, selexene / organic selenium, L-theanine act as a transport system to increase the bioavailability of the molecule. OYOX also contains ascorbic acid (vitamin C), which acts as a natural antioxidant. OYOX is packaged in a SMART (smart) capsule that releases the product in the small intestine, thereby increasing the absorption of valuable molecules (https://oyox.eu/clinical-researches).

Influence of the OYOX preparation on the state of the basic biochemical and clinical parameters of the organism. In order to assess the role of OYOX drugs in the treatment and prevention of metabolic disorders, we conducted a study aimed at assessing the main biochemical and clinical parameters of patients taking OYOX. The study involved 18 people aged 32 to 82 years. All patients showed signs of metabolic disorders. So, the results of the main biochemical parameters are presented in table 1.

Table 1. Biochemical parameters before and after taking OYOX

Index	Reference values	Before treatment	After treatment
Total protein	66-87	69,5±2,5	77±2,5
Urea	1,7-8,3	5,4±0,5	6,3±0,5
Creatinine	44-97	76±5,5	73±5
Total bilirubin	от 2 до 21	12±0,5	12±0,5
Cholesterol	3,63-5,2	6,7±1	6±1,1
Triglycerides	0-1,7	2,5±0,5	1,97±0,5
HDL	0,9-1,54	2,6±0,1	2,4±0,1
LDL	1,6-4,3	4,3±0,05	3,7±0,05
ALT	0-32	21,1±2,5	20±1
AST	0-31	23±2,2	20±1

As we can see from the presented data, patients have a significantly significant increase in the normal level of cholesterol, triglycerides, HDL and LDL. Cholesterol levels above 6 mmol / L are considered elevated and are considered a risk factor for metabolic disorders. This poses a health risk as it can provoke atherosclerosis.

Elevated cholesterol in the blood contributes to the development of atherosclerotic damage to the walls of blood vessels and is one of the risk factors for the development of severe cardiovascular diseases such as angina pectoris (coronary heart disease) and myocardial infarction, cerebral stroke and intermittent claudication. Thus, the average level of cholesterol in the blood of patients before taking OYOX was 6.7 ± 1 mmol / L. After taking the drug, the average group indicators were 6 ± 1.1. There is a gradual normalization of the cholesterol level, its approximation to the norm.

The most pronounced changes are observed in the level of cholesterol and triglycerides (Fig. 1).

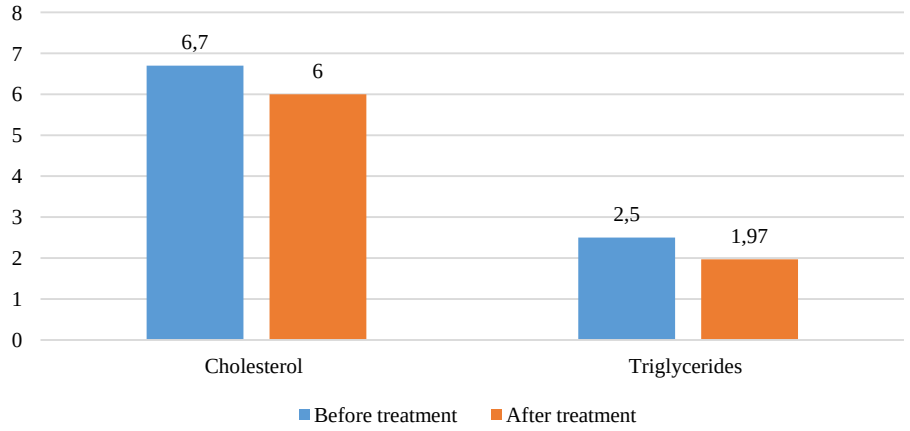

Figure 1. Cholesterol and triglyceride levels before and after treatment

At the same time, there is mainly an increase in HDL (before treatment, the indicators were 2.6 ± 0.1, while the norm was up to 1.54 mmol / L. After taking OYOX, the indicators decreased significantly (to 2.4 ± 0.1 mmol / L). lower than the level of HDL. So, before treatment, these indicators were 4.3 ± 0.05 with a maximum threshold value of 4.3 mmol / L. After taking OYOX, the indicators decreased to 3.7 ± 0.05, which corresponds to the reference values (Fig. 2).

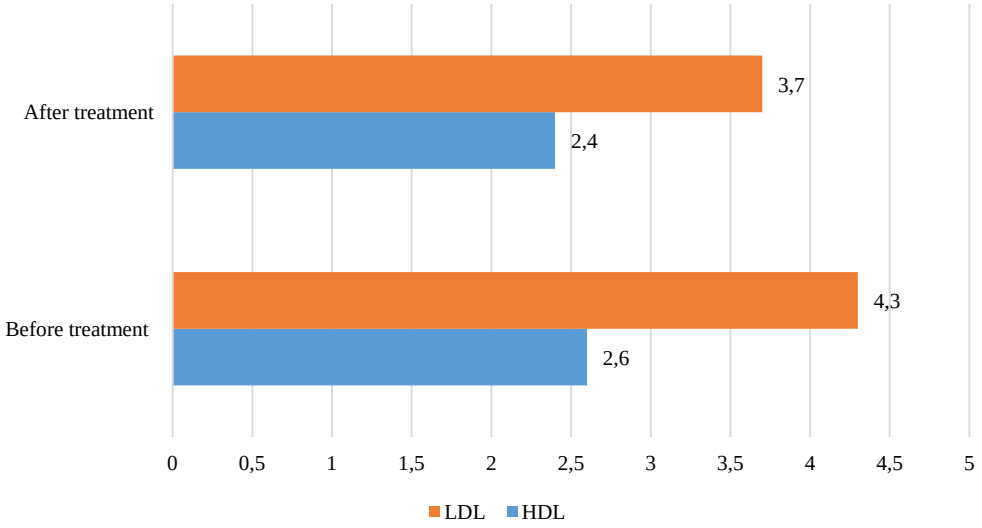

Figure 2. HDL and LDL levels before and after treatment

Also, patients have an increase in triglyceride levels, which is also a symptom of metabolic disorders. Thus, the average group level of triglycerides before taking OYOX was 2.5 ± 0.5 at a rate of 0-1.7 mmol / l. After taking OYOX, the indicators decreased to 1.97 ± 0.5, which, although it exceeds the norm, is already approaching it as much as possible. Certain conditions associated with metabolic disorders are often associated with elevated triglyceride levels. This may mean that individuals with secondary hypertriglyceridemia may have minor inherited metabolic defects.

Obesity is the most common metabolic stressor associated with hypertriglyceridemia. A similar relationship was found with poorly controlled type 2 diabetes and excessive drinking. Thus, according to the results of biochemical analyzes, it can be concluded that the dietary supplement OYOX has a positive effect on metabolic processes, contributing to the normalization of metabolic processes in the body.

In particular, there is a significantly significant decrease in cholesterol levels, primarily due to a decrease in HDL levels, as well as a decrease in triglyceride levels. Next, we analyzed the main clinical parameters of patients before and after taking OYOX (Table 2).

Table 2. Clinical indicators before and after taking OYOX

Index	Reference values	Before treatment	After treatment
Glycolized hemoglobin	4,1-5,7	6±1,5	5,9±1,2
Hemoglobin	120-140	133±15	129±15
Erythrocytes	3,9-4,7	5,7±1,2	5,3±1
Platelets	180-320	233±10	237±10
Leukocytes	от 4 до 9	7±1	7,3±1,2
Stab neutrophils	от 1 до 6	2,5±0,5	3,5±0,5
Segmented neutrophils	47-72	20,5±2	57,7±2,5
Eosinophils	0,5-5	3,3±0,1	3,4±0,05
Lymphocytes	19-37	28±2	28±1,5
Monocytes	от 3 до 11	7±0,5	6,2±0,5
ESR	15-20	15±1,5	12±2
Telomere length		13,05±2	13,8±2

As can be seen from the table, the drug OYOX helps to normalize the level of glycated hemoglobin and erythrocytes, which helps to reduce hypoxic phenomena, saturation of blood with oxygen, and a decrease in carbon dioxide levels. All this helps to reduce the number of free radicals in the blood, prevents the risk of oxidative stress, and, accordingly, contributes to the achievement of an anti-aging effect, normalization of metabolic processes. There is also an increase in the number of stab and segmented neutrophils, which indicates the state of human immunity (Fig. 3).

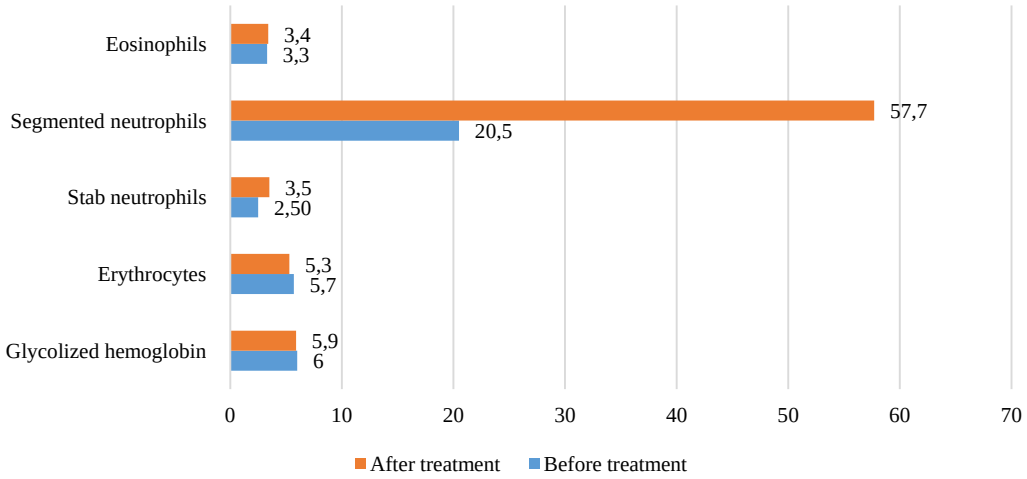

Figure 3. Dynamics of the main clinical indicators

The drug has no pronounced effects on the level of eosinophils, which suggests that the drug does not cause allergic reactions.

4 Conclusions

Disruption of metabolic processes has an adverse effect on the entire body and is a risk factor for serious diseases. Metabolic disorders underlie metabolic disorders (MS). Thus, MS is characterized by an increase in the mass of visceral fat, a decrease in the sensitivity of peripheral tissues to insulin and hyperinsulinemia, disorders of carbohydrate, lipid, purine metabolism, and arterial hypertension. The main manifestation of MS is abdominal obesity. Metabolic disorders (metabolism) are manifested at almost all levels of the biological systems of the body - at the cellular, molecular and others. In persons with MS, according to echoencephalography, psychological tests, there are clear signs of a stress state.

The hypothalamic-pituitary system in a stressful situation is characterized by increased activity. Metabolic disorders lead to the development of various diseases, in particular, to homeostasis disorders, atherosclerosis, coronary heart disease, strokes and myocardial infarction. The role of MS in the development of infertility is increasing. Thus, in recent decades, there has been a steady increase in various types of neuroendocrine disruptions in women with metabolic disorders, leading to impaired fertility.

Also in clinical practice, diseases are described in detail, which are inevitably accompanied by signs of metabolic disorders: gout, hypercholesterolemia, phenylketonuria, Girke's disease, alkaptonuria, albinism. In addition to these diseases, signs of metabolic disorders are characteristic of many other pathologies, usually developing genetic deformities.

Recent studies have demonstrated the high effectiveness of diet and physical activity in correcting metabolic disorders. However, nutrition is not able to fully meet all the body's needs for nutrients, vitamins and minerals. The fastest, economically acceptable and scientifically grounded way of solving this problem is the creation and widespread use of dietary supplements in everyday nutrition. It is proved that the drug OYOX has a positive effect on the indicators of metabolic processes.

We analyzed the effect of the OYOX preparation on the state of the basic biochemical and clinical parameters of the organism. Based on the results of biochemical analyzes, it can be concluded that the dietary supplement OYOX has a positive effect on metabolic processes, contributing to the normalization of metabolic processes in the body. In particular, there is a significantly significant decrease in cholesterol levels, primarily due to a decrease in HDL levels, as well as a decrease in triglyceride levels.

According to the results of clinical studies, OYOX helps to normalize the level of glycated hemoglobin and erythrocytes. An increase in the number of stab and segmented neutrophils is noted, which indicates the normalization of the state of human immunity. The drug has no pronounced effects on the level of eosinophils, which suggests that the drug does not cause allergic reactions.

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Primary Paper Section: A

Secondary Paper Section: AA, AI