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LIPID METABOLISM IN LIVER DYSFUNCTION

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Abstract
This article analyzes the role of lipid metabolism in liver dysfunction and its impact on the body. The main causes and consequences of lipid metabolism disorders in non-alcoholic fatty liver disease are highlighted. The results of the study show that lipid metabolism disorders increase inflammatory processes in the liver and lead to the development of fibrosis.

Keywords: : Liver, metabolism, lipids, JNYoX, physiotherapy.

INTRODUCTION

The liver, the largest gland of the digestive system, is located under the right dome of the diaphragm. In adults, a healthy liver makes up about 3% of the body weight. The liver is one of the central organs involved in the metabolism of the body. It receives substances digested in the gastrointestinal tract through the hepatic portal vein and transfers them to the general circulation. The main biochemical processes of the body in which the liver participates are: Carbohydrate metabolism. Protein metabolism and the synthesis of its end product, urea. Metabolism of fats, synthesis of bile acids, which are necessary for their digestion, bile formation. Synthesis of substances necessary for other organs; synthesis of glucose, ketone bodies and blood plasma proteins. Neutralization of toxic substances formed during metabolism in the body and entering the body from the external environment. Transfer of certain substances formed as a result of metabolism (cholesterol, bile acids, bile pigments and other substances) to the intestine. Conversion of provitamins into vitamins. Participation in the synthesis of iron transporter - transferrin, ferritins and other functions. The liver is involved in the metabolism of nutrients - carbohydrates, lipids, proteins, vitamins and partly water - minerals. The regulation of lipid metabolism is associated with the biosynthesis of various lipids (cholesterol, triacylglycerol, phosphoglyceride, sphingomyelin, etc.) in the liver, which are distributed to other tissues through the bile. The amount of cholesterol synthesized in the liver is greater than that absorbed with food: on average, if the human body consumes 0.3 - 0.5 g of cholesterol with food every day, the liver synthesizes 2 - 4 g of cholesterol per day. The distribution of lipids to organs and tissues is carried out by the liver. In addition, ketone bodies are formed in the liver from the breakdown of fatty acids, which are used as an energy source in organs other than the liver [1].

Nonalcoholic fatty liver disease (NAFLD) is also directly related to lipid metabolism. This disease is chronic and combines clinical and morphological changes that occur in people who do not consume alcohol in excess of the norm, that is, in men no more than 40 g, in women no more than

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20 g, due to the accumulation of lipids in liver cells, morphologically manifested in the form of steatosis, steatohepatitis, fibrosis, cirrhosis. Hepatic steatosis is an excessive accumulation of triglycerides in the cytoplasm of hepatocytes (if it makes up more than 5% of the liver mass); Small fat bodies in hepatocytes (if the fat content increases to 2-3%) can be detected under a light microscope, and this pathological condition can be considered the beginning of hepatic steatosis. Nonalcoholic steatohepatitis (NASG) is a chronic diffuse liver disease characterized by necrotic-inflammatory processes leading to the formation of fibrosis; liver fibrosis is the proliferation of connective tissue without changes in the structure of the organ; liver cirrhosis (LC) is the irreversible replacement of liver parenchymal tissue with fibrous connective tissue and the formation of a special nodular anatomical formation in its place. Adipose tissue is a type of tissue that has the properties of an endocrine organ. The high density of corticosteroid and androgen receptors and the low density of insulin receptors create special conditions for its functioning. High sensitivity to the lipolytic effect of catecholamines and low sensitivity to the antilipolytic effect of insulin lead to hormonal disorders in obese patients and contribute to IR. Metabolic processes occur in adipose visceral tissue, which has an extensive network of capillaries communicating with the portal system. Fat in the abdominal cavity is easily lipolytic, and as a result, free fatty acids are released into the portal vein. Excess free fatty acids accumulate in hepatocytes and are converted into triglycerides, forming low-density lipoproteins, which contributes to hyperlipidemia. Some of the free fatty acids are involved in gluconeogenesis and lead to excessive secretion of glucose by the liver into the bloodstream. Increased uptake and production of fatty acids by hepatocytes leads to a decrease in the sensitivity of the liver to insulin, which in turn leads to the continuation of hyperinsulinemia, which stimulates lipolysis, and hepatocyte dystrophy. The release of free fatty acids, stimulation of hepatic lipogenesis - fatty degeneration of hepatocytes occurs. The hormone that regulates fatty acid homeostasis is leptin, which is secreted mainly by adipocytes of white adipose tissue, is a product of obesity gene expression, affects energy metabolism, body weight regulation, angiogenesis, fibrogenesis, and inflammatory processes. participates in immune responses. According to a number of authors, hyperleptinemia is involved in the development and exacerbation of JNYOX. Despite the growing interest in the study and treatment of JNYox in the global and domestic scientific community, the issue of effective specific treatment has not been resolved. The main directions of pharmacological treatment of JNYox are to increase the sensitivity of tissues to insulin and reduce the degree of liver damage and the inflammatory process, and even then they are used only against the background of lifestyle change measures. Therefore, the basis of any treatment regimen for JNYox is lifestyle change, that is, changing the qualitative and quantitative composition of the diet, reducing body weight and increasing physical activity. Changing habits and lifestyle, as existing functional systems in human behavior, requires great effort and attention. The long-term effectiveness of non-drug treatment methods depends on the motivation and discipline of patients. The complexity and versatility of the pathogenetic mechanisms of lipid metabolism disorders in the body require effective pharmacological correction aimed at normalizing the composition, structure and ratio of various classes of lipoproteins. Early and adequate phytotherapy, as a type of additional metabolic therapy, helps to correct and restore impaired lipid metabolism and prevents the development of organic changes in target organs. According to the effect on lipid metabolism and the mechanism of action, herbal

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preparations with hypolipidemic properties are divided into several groups. Thus, they reduce the absorption of cholesterol in the intestine and limit its penetration into the endothelium of vascular vessels, containing plant sorbents - sitosterols. The mechanism of their lipid-lowering action is explained by inhibiting the absorption of exogenous cholesterol and inhibiting the enterohepatic recirculation of bile acids. These properties are attributed to the flowers of mountain arnica (arnica montana), the fruits of carrot-like visnaga (ammi visnaga), the bark of the horned elm (ulmus laevis), and the common. fruits and leaves of viburnum (viburnum opulus), roots and rhizomes of medicinal burnet (sanguisorba officinalis).

Other plants containing sitosterols and rich in monounsaturated fats have the ability to inhibit the synthesis of cholesterol and triglycerides, as well as increase their utilization in the body. It has been studied that monounsaturated fats have a positive effect on lipid metabolism, selectively reducing the atherogenic fraction of low-density lipoproteins. This effect is clearly manifested in the ripe fruits of walnut (Juglans regia), leaves of large plantain (Plantago major), medicinal yellow tea (Agrimonia eupatoria), grass and roots of hairy astragalus (Astragalus dasyanthus), grass and roots of tribulus terrestris (Tribulus terrestris). The same properties are found in the leaves of red hawthorn (Crataegus sanguinea), the fruits and fresh leaves of cranberry (Vaccinium vitis-idaea), and the herb of St. John's wort (Hypericum) [14]. The seeds richest in monounsaturated fats are olive and corn oils, as well as walnut, avocado, rapeseed and peanut oils [11].

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