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THE IMPORTANCE OF THE LIVER IN LIPID METABOLISM

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Annotation: The liver occupies one of the central places in lipid metabolism. The rate of lipid metabolism in the liver depends on the composition of food consumed and the physiological state of the body. The study of lipid metabolism in the liver under the influence of heliotrine helps to study the mechanisms of hepatitis development.

Key words: Lipid, liver, heliotrine, organism, bioeffector, cell, physiological, saturated fatty acids, alcohol, unsaturated fatty acids.

Over the past 20 years, scientists' interest in lipids has increased dramatically. "Lipid" refers to various natural substances that differ sharply from each other in their chemical structure.

These include free fatty acids, neutral glycerides, waxes, phospholipids, including glyceroglycolipids, oxylipids, sterols, and others. Lipids have three main functions: first, lipids are the most important components of cell membranes; secondly, lipids are important bioeffectors that control cooperation between cells and intracellular biochemical reactions, as well as various physiological processes in the body; and finally, thirdly, a form of metabolic fuel whose sole function has been considered for many years. It is now clear why lipids need such a diverse chemical structure, because bioeffectors act cooperatively with their targets, that is, the specificity of the effect is determined by the structure of the molecule.

The liver occupies one of the central places in lipid metabolism. The amount of lipids in the liver of adult rats fluctuates between 4.8-5.3%. The rate of lipid metabolism in the liver depends on the composition of the food eaten and the physiological state of the body.

The study of lipid metabolism in the liver under the influence of heliotrin helps to study the mechanisms of hepatitis. For this reason, in studying the mechanism of action of heliotrin on the liver of animals, we aimed to determine the extent of changes in lipids in the liver tissue.

It was found that after 0.5 months after heliotrin was injected into the body of rats, the amount of lipids in the liver increased by 9.9%. After 1 month, the increase in the amount of lipid reached 18.6%. As the duration of the experiment increased, the increase in lipid content accelerated: in 1.5 and 2 months, it increased by 29.9 and 38.5%. Therefore, under the influence of heliotrin, the amount of total lipids in the liver increases.

Triglycerides make up 30-40% of total lipids in the liver, phospholipids make up 55-60%, cholesterol and other fractions make up 5-10%. Phospholipids (phosphatides), which are part of lipids, form different fractions and include phosphoric acid, high molecular weight saturated and unsaturated fatty acids, alcohols (glycerol, inositol, sphingosine) and nitrogenous bases (choline, ethanolamine, serine, etc.).

Currently, the bioeffector role of phospholipids is also known.
Diacylglycerols, inositol phosphate, inositol 1,4,5 triphosphate, and phosphatidic acids, which stimulate some forms of protein kinase C, mobilize Ca2+ from intracellular stores, and affect other processes, have been reported to be involved in signaling processes.

A small amount of lysophosphatidylcholine (1-10 μm) stimulates the activity of protein kinase C, enhances cell proliferation, stimulates lymphoid cells, and participates in similar processes.

Cholesterol plays an important role in the normalization of various physiological biochemical processes in body tissues and cells. The amount of cholesterol in the liver is 250-350 mg%.

Cholesterol is in 4 forms in the human body: 1) cholesterol-protein; in this fraction, it mainly forms complex lipoprotein complexes with α- and β-globulins; 2) colloidal cholesterol (cholesterol phosphatide); 3) free cholesterol; 4) cholesterol esters, which include high molecular fatty acids. In a normal state, the body contains mainly the first 2 fractions, the 3rd and 4th fractions are very rare, but in pathological cases their amount increases sharply, causing hypercholesterolemia. The liver plays a central role in the metabolism of fatty acids in the body. The amount of fatty acids in the liver fluctuates around 1.8-3.6%.

Fatty acids entering the liver undergo various changes to form fatty acids suitable for the formation of certain lipid fractions. In the liver, fatty acids take part in the three-carbon cycle and undergo rapid oxidation to carbon dioxide gas and water.

At present, there has been an increase in studies on the bioeffector role of semi-saturated fatty acids and their derivatives (monoacylglycerols, amides, oxylipids).

Free unsaturated fatty acids control the activity of phospholipases, ion channels, ATF aza activity, G-protein, protein kinase activity, modulate phosphoinositide and sphingomyelin cycles, control hormonal messages and gene transcription transport.

Oxylipids are not stored in a ready state in the cell, they are synthesized from choline fatty acid in response to a biological stimulus when needed by the body. The effects of oxylipids are very diverse and are involved in many processes in normal and pathological organisms.

As a result of disruption of these processes, the amount of phosphatidylcholine and phosphatidylserine in liver mitochondria increases, and the amount of phosphatidylethanolamine decreases. The inner membrane of mitochondria has various enzymes for the synthesis of cardiolipin. So, in hepatitis, the reduction of phosphatidylinositol and cardiolipin in the liver mitochondria causes a violation of mitochondrial respiration and oxidative phosphorylation.

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