BIOCHEMISTRY OF THE LIVER. BIOCHEMICAL SIGNIFICANCE OF THE LIVER IN THE ORGANISM.

Nomozov Komiljon Foziljon o'g'li
nomozovkomiljon1@gmail.com
Toshkent tibbiyot akademiyasi talabasi
Rustamov Shoxrizod Nuroli o'g'li
shahrizodbekrustamov@gmail.com Toshkent tibbiyot akademiyasi Termiz filiali talabasi
Musurmonova Asal Isroilovna
asalmusurmonova@gmail.com
Toshkent tibbiyot akademiyasi Termiz filiali talabasi
Shukurova Barchinoy Abdulhofiz qizi
barchinoyshukurova018@gmail.com
Toshkent tibbiyot akademiyasi Termiz filiali talabasi
Berdiqobilov Shoxrux Urol õğli
shoxruxberdiqobilov1@gmail.com
Islom Karimov nomidagi Toshkent davlat texnika universiteti Olmaliq filali talabasi
https://doi.org/10.5281/zenodo.10060109

Abstract: The liver is one of the central organs involved in the body's metabolism. It performs important tasks in taking the substances formed as a result of digestion of food in the gastrointestinal tract through the portal vein and transferring them to the general blood circulation. The liver is fed by the portal vein and hepatic artery. The hepatic artery supplies it with oxygen and certain substances necessary for the liver. This article provides information about the biochemistry of the liver and its importance in the body.

Key words: Liver, enzyme, hormone, bilirubin, cholesterol, carbohydrates, protein.

The liver is very important for the intermediate metabolism of carbohydrates, lipids, proteins, vitamins, and similar substances, it is very important for the detoxification of substances harmful to the body. Blood plasma proteins, glucose, ketone bodies, lipoproteins are synthesized, and ammonia is neutralized and urea is synthesized as the last product of nitrogen metabolism. The liver is the largest gland in the body, weighing 1500 grams. The liver performs the following functions: 1. Carbohydrate metabolism 2. In the metabolism of proteins and in the synthesis of urea, which is the last product of their metabolism 3. In the synthesis of acids, which are a necessary factor in the exchange of fats and their digestion, and in inflammation 4. In the synthesis of substances necessary for other organs, i.e. in the synthesis of glucose ketone bodies and blood plasma proteins 5 .Detoxification of harmful substances produced in the body's metabolic processes and entering the body from the external environment, 6.Separation of certain substances (cholesterol, bile acids, bile pigments and other substances) formed as a result of metabolism into the intestine. 7. In the management of blood circulation, i.e. in connecting the valvular vein system with the general blood circulation system. 8. As a central blood-forming organ (in embryos). 9. In managing blood coagulation by production of fibrinogen, prothrombin and heparin;

More than half of the dry weight of the liver consists of proteins. About 90% of it is globulins in the protein composition. They are followed by albumins, nucleoproteins and collagens. In addition to the above-mentioned proteins, there are also chromoproteins and

ferritins specific to the liver. It is very rich in various enzymes, most of them are enzymes unique to the liver. Examples of these enzymes include the metabolism of cysteine and histidine and the release of phosphoric acid, the formation of glucuronic acid esters and enzymes. 5% of the total weight of the liver is glycogen (table). The amount of glycogen changes in various pathological conditions. Liver fat contains 1-2% neutral fats, 1.5-3% phospholipids, 0.3-0.5% cholesterol. Vitamins and minerals in food (Na, K, Ca, Fe, Zn, Cu, Mn, As, etc.) are stored in the liver. The liver differs from other organs by the variety of metabolic processes that take place in it.

Since some metabolites (salicylate, bile acids, benzoate and nicotinic acid) combine with glycolic acid to form double acids and neutralize them, this method is used to determine the detoxification ability of the liver. This method is named after Quick because it was first recommended by him. The neutralization of some substances is also accompanied by methylation or demethylation. Vitamin PP- (nicotinamide) is neutralized and released in the form of methylnicotinamide. Violation of nitrosamine neutralization can lead to the formation of dangerous tumors in various organs. A substance that causes healthy cells to turn into tumor cells is called a carcinogen. Benzanthracene and aflatoxins produced by fungi are carcinogenic substances and are neutralized by epoxidation in the liver. In the liver, various biologically active substances (adrenaline, noradrenaline, histamine, serotonin, thyronine) are oxidized and neutralized under the action of aminooxidases, and estrogen, androgen, corticosteroid hormones are oxidized and excreted in the urine in the form of ketosteroids.

In newborns and infants, the ability of the liver to detoxify xenobiotics is immature. For example: the activity of conjugating glucuronyltransferase, acetylating and deacetylating enzymes in one-month-old children is four to five times lower than in adults. Therefore, the metabolism of toxic substances produced in the children's body and given medicinal substances slows down. Therefore, the amount of drugs recommended for children is determined according to their age. The excess amount of carbohydrates that enter the body with food is converted into glycogen in the liver. Glycogen synthesis in the liver is accompanied by the consumption of ATF energy. Galactose, which enters children's body in milk, is converted into glucose only in the liver. The conversion of glucose into glycogen takes place in muscles besides the liver. Therefore, testing the ability of the liver to synthesize glycogen with glucose administration may not provide accurate information. In this case, examination of glycogen synthesis in the liver with galactose administration provides more information about the activity of hepatocytes.

First of all, fructose-1-phosphate is formed by phosphorylation in the presence of ATF and under the influence of fructokinase enzyme. Fructose-1-phosphate is broken down into two trioses - glyceraldehyde and phosphodioxyacetones under the action of a special aldolase (Fig. 107). As a result of their subsequent changes, intermediate substances: pyruvic acid and glycerol can be easily formed. Since the fructose-1-phosphataldolase enzyme is located only in liver cells, the activity of this enzyme in the blood in parenchymatous hepatitis diseases increases many times and is of great diagnostic value in the diagnosis of liver diseases. In liver diseases, the activity of fructose 1,6-diphosphate aldolase also changes, but since this enzyme is also present in muscles, it does not have special properties like fructose-1-phosphate aldolase in the liver. The glucuronic acid produced by the oxidation of glucose in the liver tissue reacts with UTF (uridyl triphosphate) to form UDFG (uridyl diphosphoglucuronic acid), and neutralizes the toxic substances produced and absorbed by the body. Low production of

glucuronic acid in liver cells and a decrease in the amount of UDFG leads to a violation of its antitoxic function. The liver and muscles are the main glycogen-storing organs, thanks to which all tissues are supplied with glucose, and the amount of glucose in the blood is maintained at the same level. Potassium ion affects gluconeogenesis, and sodium affects the course of glycogenolysis reactions. The amount of potassium in liver tissue is 10 times more than in blood plasma, and the amount of sodium is 2 times less.

An excess amount of glycogen can accumulate in the body due to a violation of enzymatic processes in the liver as a result of a genetic disease. These diseases are called glycogenosis. Glycogen accumulation increases the size of the liver and causes hepatomegaly.

References:

1. "Biochemistry" R.A. Sobirova, N.M. Yuldasheva. Tashkent 2020
2. "Biochemistry and biochemical testing methods" M.M. Tadjibayev, R.A. Sobirova, M.M. Madazimov, Y.A. Madrahimov Tashkent 2017
3. "Clinical biochemistry" S.N. Dolimova, G. B. Umarova, G.M. Mukhammadjonova
4. A. Ya. Nikolayev. Biological chemistry. Tashkent. Publisher named after Ibn Sina. 1991.