THE ROLE OF MITOCHONDRIA IN ENERGY EXCHANGE IN THE BODY

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ANNOTATION

In this paper, quantitative changes in lipid content in the liver mitochondria were measured at different times after heliotrin was administered to rats to determine the pathogenetic significance of hepatitis in the liver.

Keywords: mitochondria, lipid, liver, hepatitis, membrane, phospholipid, organella.

The matrix contains Krebs (or tricarboxylic) cycle enzymes. The enzymes that make up the electron transport system are located inside the membrane.

In the matrix of the liver mitochondria, 67% of the total proteins are located in the outer membrane, 21% in the inner membrane, and 6% in the intermembrane space. These 4 compartments store a specific group of enzymes that are suitable for their function.

The permeability of the inner membrane of the mitochondria is so low that only small molecular substances (molecular mass less than 100) can pass through this membrane.

For this reason, this membrane contains transport systems that transport substances such as intermediates of respiration (pyruvate, metabolites of the citric acid cycle), amino acids, ATF, ADF, phosphate, Sa2 +.

Using an electron microscope on the matrix side of the inner membrane and on the crystals, a fungus-like membrane ATF surface (elementary particles) with a round head diameter of 7–9 mm and a leg length of 4 mm can be seen.

The outer membrane contains the enzymes acyl-CoA synthetase and monoamine oxidase, which activate phospholipids and fatty acids.

One of the differences of the outer membrane from the inner membrane is that it retains a large amount of cholesterol, with more phosphatidiphyletanolamine, phosphatidylcholine and phosphatidylinositides than phospholipids. Among mitochondrial cell organelles, it is the most sensitive to external and internal environmental influences. In addition, mitochondria play an important role in appoptosis. To determine the pathogenetic significance of hepatitis in the liver, changes in mitochondrial function in different physiological and pathological conditions depend on changes in its structure, ie the quality and quantity of lipids located in the membrane.

The introduction of heliotrin into the body of rats led to a decrease in the total amount of phospholipids in the liver mitochondria, and an increase in free fatty acids and phosphatidic acid. These changes were accelerated depending on the amount of heliotrin introduced into the animal's body. 0.5 of the experiment; At 1 and 2 months, the total amount of phospholipids in the liver mitochondria was 12.8; Decreased by 22.7 and 41.3%, and the amount of free fatty acids was 24.4; 38.1 and 52.7%, and the phosphatidic acid content was 44.5; Increased by 63.3 and 106.8%, respectively.

The obtained results indicate an increase in the catalytic activity of the enzymes phospholipase A2 and phospholipase D located in the mitochondrial membrane under the influence of heliotrin [5].

Our next experiment was to determine what changes in the composition of other phospholipids in the liver mitochondria occur under the influence of heliotrin.

When heliotrin is injected into the body, 0.5 of the experiment; Increased levels of phosphatidylcholine (8.7; 9.4 and 11.7%) and phosphatidylserine (2.4; 6.3 and 12.0%) in the liver mitochondria at 1 and 2 months, phosphatidylethanolamine (7.2; 10). , 0 and 8.8%, respectively. An increase in the amount of phosphatidylcholine and phosphatidylserines in the mitochondria under the influence of heliotrin, and a decrease in phosphatidylethanolamine, in our opinion, may be the result of changes in the ongoing methylation and decarboxylation reactions in liver tissue [8].

Under the influence of heliotrin, the amount of phosphatidylinositide in the liver mitochondria decreases and this process accelerates as the experiment progresses. If the amount of phosphatidylinositol decreased by only 14.8% in 0.5 months of the experiment, it decreased by 20.9% in 1 month and by 28.7% in 2 months. One of the interesting aspects of the physiological role of phosphatidylinocyte metabolism is its participation in energy transformation in the cell [9].

The introduction of heliotrin into the body led to a decrease in the amount of cardiolipidine in the hepatic mitochondria, and this process intensified in accordance with the continuation of the experiment. If in 0.5 months of the experiment the amount of this phospholipid decreased by only 6.7%, in 1 month it decreased by 9.0% and in 2 months by 16.8%. Thus, when heliotrin is introduced into the body, the synthesis of cardiolipin in the mitochondria slows down or becomes endogenous.

the catalytic activity of phospholipases is increased. Under the influence of heliotrin, the amount of lysophosphatidylcholine in the liver mitochondria decreased. The higher the amount of heliotrin introduced into the body, the lower the lysophosphatidylcholine. If the amount of this lysophospholipid decreased by only 6.5% in 0.5 months of the experiment, it was 14.1% at 1 month and 22.2% at 2 months. In our opinion, the hydrolytic activity of lysophospholipase A1 and phospholipase D in the liver mitochondria is increased under the influence of heliotrin [7].

Membrane lysophospholipase A1 regulates the permeability of the mitochondrial membrane and the degree of mitochondrial dysfunction, ensuring that lysophospholipids and their diacyl forms are normal. Phospholipase D not only affects phospholipids, but also hydrolyzes lysophospholipids [3].

Under the influence of heliotrin, phosphatidic acid in the liver mitochondria increases sharply, and this process intensifies as the experiment continues. If, in 0.5 months of the experiment, the amount of phosphatidic acid increases by 44.5%, it reaches 63.3% at 1 month, and doubles (106.8%) in 2 months. In our opinion, an increase in phosphatidic acid in the hepatic mitochondria under the influence of heliotrin may be due to an increase in the hydrolytic activity of phospholipase D located in the membrane or an increase in phosphatidyl acid synthesis in the liver [2].

0.5 of the experiment; In months 1 and 2, this ratio was 17.3; Increased by 21.9% and 21.9%, respectively. Under the influence of heliotrin, changes in the ratio of the diacyl form of phospholipids in the hepatic mitochondria with their lysoshakes were also detected. The ratio of phosphatidylcholine / lysophosphatidylcholine

increased under the influence of heliotrin and this process intensified as the experiment continued. If in 0.5 months of the experiment this ratio increased by only 16.2%, in 1 and 2 months it increased by 27.4 and 46.7%. In our experiment, the introduction of heliotrin into the body revealed common phospholipids in the liver mitochondria, including cardiolipin, phosphatidylethanolamine, lysophosphatidylcholine increases the amount of phosphatidylcholine and lysophosphatidylcholine in the mitochondria to those of healthy animals.

0.5 of the experiment; At 1 and 2 months, the amount of phosphatidylethanolamine in the liver mitochondria of hepatitis rats was 8.8 times higher than normal; Decreased by 14.6 and 15.6%, and phosphatidylserine by 12.0; Increased by 21.0 and 25.2%, and in animals receiving phyto-tea in the 0.5 and 1 months of the experiment, the former decreased by 9.7 and 3.9%, and the latter by 10.4 and 8.3%, approaching the norm. By 2 months of experimentation, phytochoy had brought these two phospholipid levels back to full normal.

Conclusion . Phytochoic activity allows the liver to maintain a constant level of essential phospholipids of the liver mitochondria, which are necessary to maintain the physicochemical properties of the membrane. The introduction of phytochoy into the body of rats with hepatitis led to a gradual decrease in the amount of phosphatidic acid in the liver mitochondria and approaching the norm at 2 months of treatment.

The results obtained show that phytochoy has an effect in chronic heliotrinous hepatitis. Thus, phytochoy allows the quantity and quality of phospholipids, which play an important role in the architecture of biological membranes, to be maintained.

LITERATURE :

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