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THE USE OF AMINO ACIDS FOR CORRECTION IN CHRONIC ALCOHOL INTOXICATION

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Abstract
The liver is a very resilient organ with unique regeneration abilities. Even if there are very few healthy cells left in it, the liver will continue to perform its functions.However, alcohol can completely destroy this organ in just a few years.Drinking alcohol leads to alcoholic liver disease (ALD), which ends in cirrhosis of the liver and death.

Keywords: chronic alcohol intoxication, Trivamin , Talerin , alanine aminotransferase (ALAT), aspartate aminotransferase (AST), alkaline phosphatasea (AP)

Relevance

The great medical and social significance of the problem of alcoholism is well known. In practical healthcare, its solution is assigned to narcologists, whose efforts are aimed at suppressing the mental and physical dependence on alcohol. At the same time, little attention is paid to damage to internal organs. The only exception is alcohol cardiomyopathy and liver damage in alcoholism, the pathogenesis and morphogenesis of which has been intensively analyzed, especially in recent years. Almost all alcohol that enters the body is processed by the liver. In it, ethyl alcohol is first converted into toxic acetaldehyde, and then into safer acetic acid. If ethanol enters the liver regularly, the cells involved in its processing gradually cease to cope with their duties. Acetaldehyde accumulates in the liver, poisoning it, and ethyl alcohol contributes to the deposition of fat in the liver and the death of its cells. Pathological processes in the body, induced by the consumption of ethanol, are to a certain extent mediated by impaired intake and the development of a deficiency of a number of essential nutrients in the body of patients with alcoholism . These necessary compounds include amino acids, the content and metabolism of which are disturbed in alcoholism. C free amino acids are the material for the synthesis of proteins and biologically active substances, hormones, enzymes, nucleic acids and vitamins in the body. Chronic consumption of ethanol leads to impaired absorption of amino acids in the gastrointestinal tract . This, in turn, causes a violation of protein synthesis, accompanied by pathological changes in organs and tissues , especially in the liver. Obviously, it is amino acid metabolism

disorders that play a leading role in the pathogenesis of many complications of cirrhosis and other liver pathologies. Amino acid imbalance that develops in the body is an adaptive response to chronic alcohol consumption. In this regard, the development of new pharmacological approaches to the correction of metabolic disorders in alcoholism seems important and relevant. Clinical studies have shown that some amino acids can reduce the toxic effects of ethanol and its metabolic products, be used in the correction of metabolic disorders in patients with alcoholism and the treatment of somatic consequences of chronic alcohol intoxication . This allows the use of amino acids not only as a plastic and energy material, but also as compounds with specific functions. Thus, tryptophan and arginine, which are part of the " Polyamine " composition, in experimental studies prevented some of the destructive effects of ethanol on intracellular membranes and impaired albumin synthesis in the liver. The use of taurine in detoxification therapy is also justified , since it has a membranotropic effect and a wide range of physiological effects [3]. The therapeutic use of branched hydrocarbon chain amino acids (BCAAs) (isoleucine, leucine, valine) in the treatment of liver diseases has been tested. Thus, the deficiency of amino acids (especially essential ones) in chronic alcohol intoxication makes it reasonable to use amino acids and their compositions in this pathology.

Goal of the Work

To study the activity of a number of enzymes in the liver and blood serum of rats with chronic alcohol intoxication and the use of amino acid compositions.

Research Methods

The experiments were performed on outbred female rats weighing 180-220 g. Animals of the control group were injected with 0.9% NaCl solution intragastrically (i.v.) 2 times a day. When modeling chronic alcohol intoxication (CAI), the animals were injected with a 25% solution of ethanol i.v. at a dose of 3.5 g/kg of body weight 2 times a day for 14 and 29 days . To correct metabolic disorders in CAI, the amino acid composition " Trivamine " (leucine - isoleucine - valine) was used. -t aurine - tryptophan) and the experimental amino acid-vitamin -mineral composition " Talerin " (taurine - leucine - riboflavin - zinc sulfate - magnesium sulfate). " Trivamine " was administered intragastrically 30 minutes after each injection of ethanol at a dose of 600 mg/kg, and the composition " Talerin " was prescribed according to a similar scheme at a dose of 125 mg/kg. The activity of alanine aminotransferase (AlAT), aspartate aminotransferase (AST), and alkaline phosphatase (AP) was determined in liver homogenates and blood serum by modified kinetic methods .

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Results and its Discussion

After 29 days of ethanol administration, the ALT activity in the liver of experimental animals increased statistically significantly by 35% compared with the control, and AST by 24% (table). It should be noted that this effect depends on the duration of alcoholization and does not appear after a two-week introduction of ethanol. ALT activation may be a consequence of adaptive changes in the integration of carbohydrate and amino acid metabolism and is carried out at the level of the glucose - alanine shunt. The studied amino acid compositions show a corrective effect on ALT . With the introduction of the compositions " Trivamin " and " Talerin ", the activity of ALT decreases and is 108% and 112% compared with the control, respectively (table). Changes in AST activity when using the studied compositions are not statistically significant.

Table - The activity of enzymes in the liver of rats with chronic alcohol intoxication and the results of the appointment of amino acid compositions

Index	Control	KhAI - 14 days	KhAI - 29 days	KhAI+ Trivamin	KhAI+ Talerin
ALA T (μmol /h/mg protein)	1.7 2 ±0.0 6	1.79 ± 0.0 4	2, 36 ±0.0 5 *	1.89±0.05 ○	1.94±0.06 ○
AsA T (μmol /h/mg protein)	1.69±0.05	1.76±0.06	2.10±0.04	1.85±0.04	1.98±0.05
ALP nmol /min/mg protein)	(17.43±1.7	16.78±0.8	23.78±1.6*Δ	18.10±0.8 ○	18.44±0.9 ○

Note: *- statistically significant changes compared to control ($p<0.05$); Δ - statistically significant changes compared to CAI - 14 days; ○ – statistically significant changes compared to KhAI – 29 days. ALP activity in the rat liver significantly increases with CAI for 29 days (136% compared with the control). Additional introduction of the compositions " Trivamine " and " Talerin " normalizes the increased activity of the enzyme (108% and 105%, respectively). In blood serum, no significant effect of amino acid compositions on the activity of the studied enzymes was revealed. Conclusions. The research results indicate that the compositions of the amino acids " Trivamine " and " Talerin " reduce the toxic effect of ethanol on the liver of experimental animals. The introduction of the studied amino acid compositions normalizes the increased activity of ALT and ALP in the liver during CAI , which creates the prerequisites for their use for the correction of metabolic disorders in the complex therapy of alcoholism.

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