

THE ROLE OF THE CHANGES IN INTESTINAL MICROBIOTA AND MICROBIOTA EXOMETABOLITES IN THE DEVELOPMENT, COURSE AND PREVENTION OF NON-ALCOHOLIC FATTY LIVER DISEASE

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RELEVANCE. In recent years, non-alcoholic fatty liver disease (NAFLD) is of frequent occurrence and is diagnosed in 37.3% of the Russian population. One of the factors contributing to the development of NAFLD is a disturbance of the qualitative and quantitative composition of the intestinal flora — dysbiosis.

The objective of our study was to determine the effect of disturbances of intestinal micro flora and its metabolites on the development, course, and prevention of NAFLD.

MATERIALS AND METHODS. 25 overweight patients age 45.4 ± 16.2 with NAFLD (with steatosis) were examined. There were included such methods as: questioning, inspection, assessment of life quality (SF-36), clinical and biochemical blood tests, Fibromaks-test, analysis of the metabolome of blood, bacteriological examination of the contents of the colon (PCR-RT), bioimpedance analysis of the component composition of the body and an ultrasound examination of the liver (SPD). All patients took "Gepagard Active": containing essential phospholipids, L-carnitine, and vitamin E. (Eurasian patent № 019268 from 28.02.14), 1 capsule 3 times a day during a meal for 3 months.

RESULTS: All patients were found to have a microbial imbalance (dysbiosis of the colon), expressed as a significant decline in the proportion of Bacteroides. After treatment there was a significant increase from $11.3\% \pm 10.6$ (media \pm CO) to $47.6\% \pm 28.8$ of the total number of microorganisms ($p < 0.0001$). It shows the

ability of the drug to restore the microbial balance in the large intestine associated with excess body weight and the risk of systemic metabolic disorders. This fact proves the prebiotic effect of the drug (patent RF № 2571495 from 20.12.2015). Metabolic analysis of blood revealed 92 connections (4 connections are associated with the development of NAFLD). After therapy an overall increase in the number of metabolites in the blood was observed. It was achieved due to the mobilization of fatty acids from fat depots, and an increase of the activity of their oxidation in the liver, which was the result of activation of lipolysis in adipose tissue. The level of 3-oxopropionate acid in serum may be a marker of changes of microbial metabolism in the colon during the treatment. All the patients noted a decrease in body mass on average by 10.7%. In addition, the positive dynamics of clinical laboratory indicators was achieved.

CONCLUSION: All the patients with NAFLD suffered from dysbiosis associated with obesity and systematic metabolic disorders. Gepagard Active optimizes the qualitative and quantitative composition of microflora and its metabolites. It improves the quality of life and the condition of the liver. Furthermore, it reduces excess weight. All these suppress symptoms of NAFLD and prevents its progression.

REFERERNCES

1. **BELLANTANI S., SACCOCCIO G., MASUTTI F. ET AL.** Prevalence and risk factors for hepatic steatosis in northern Italy // *An. Intern. Med.* – 2000; 132: 112–7
2. **MORINO K., PETERSEN K.F., SHULMAN G.I.** Molecular mechanisms of insulin resistance in humans and their potential links with mitochondrial dysfunction // *Diabetes.* – 2006. – Vol. 55 (suppl. 2). – P. S9–S15. 14 (1). – P. 12–27.
3. **SELIVERSTOV P.V.** Nonalcoholic fatty liver disease: from theory to practice // *Archives of internal medicine.* – 2015; 1 (21): 19–26.11.
4. *Int. J. Mol. Sci.* 2014, 15, 8713-8742; doi:10.3390/ijms15058713
5. The ways of verification of non-alcoholic fatty liver disease / P.V. Seliverstov at all. // *Doctor*–2015. – №10. P. 53–55