

Abstract

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Bioanalytical laboratory diagnostics in healthcare

Diploma thesis

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Title: Effect of diet on the development of liver damage of non-alcoholic steatohepatitis in mice

This thesis deals with the study of non-alcoholic steatohepatitis (NASH), which is considered to be a very serious chronic liver disease. Non-alcoholic steatohepatitis is an advanced form of NAFLD (non-alcoholic fatty liver disease) and is characterized by the presence of hepatic steatosis and inflammation. NASH can be followed by complications such as liver cirrhosis or hepatocellular carcinoma.

For NASH research, the first thing to do is to choose the right animal model and diet. In this regard, the CDAA-HFD dietary model, which was also specified in this work, appears to be a very effective model for the study of NASH and hepatocellular carcinoma. The aim of the present study was to investigate the effect of that dietary regimen on the development of hepatic damage of the character of non-alcoholic steatohepatitis. For this purpose, selected parameters of liver fibrosis were monitored in mice in which the mentioned damage was induced by the dietary regimen.

The study included 9-week-old male mice of the C57BL/6J strain, which were divided into two groups: a control group (n=6) with a standard laboratory diet (chow diet), the other group (n=8) with a CDAA-HFD diet (choline-deficient L-amino acid defined high fat diet).

Fibrotic tissue damage was induced in the CDAA-HFD diet group, therefore we could observe increased expression of our tested proteins: GFAP (glial fibrillary acidic protein), α -SMA (alpha smooth muscle actin) and Mac-2 (galectin 3). These markers were tested by western blot. Liver damage was also confirmed by elevated biochemical parameters ALT (alanine aminotransferase), AST (aspartate aminotransferase) and total bilirubin in the blood. The liver weight/body weight ratio of subjects in the control group and the CDAA HFD group indicated an apparent development of hepatomegaly in mice on the CDAA-HFD diet.

In the present study, the effect of CDAA HFD diet on the development of liver damage of the character of non-alcoholic steatohepatitis with developed liver fibrosis in a mouse model was confirmed and its suitability for further experiments was confirmed.

Key words: NASH, liver fibrosis, CDAA-HFD, western blot