

Abstract

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Effect of soluble endoglin on cholesterol metabolism in the liver of high-fat diet-fed transgenic mice

Diploma thesis

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Background:

Increased plasma concentrations of soluble endoglin (sENG) are observed in metabolic diseases like diabetes mellitus type 2 or hypercholesterolemia. It has already been shown that sEng influence the cholesterol metabolism in healthy mice fed standard laboratory diet. However, the effect of sENG on cholesterol metabolism in combination with high fat diet (HFD) is not known yet. The aim of this diploma thesis was to elucidate the influence of the sENG on the metabolism of cholesterol in the liver of transgenic mice (Sol-Eng⁺), with liver damaged by NASH (Non-alcoholic steatohepatitis) induced by HFD.

Methods:

Three months old male mice (Sol-Eng⁺) with high plasma levels of sENG on the basis of the CBAxC57BL/6J and control „wild-type“ mice with unspecified levels of soluble endoglin (n=8, in each group) we used in this study. The animals were divided into groups according to the level of soluble endoglin and the type of diet: „wild-type“ fed for six months with standard laboratory diet (WTchow); „wild-type“ with high fat diet (WT_{HFD}) and high-plasma sENG group fed HFD for six months (sENG_{HFD}). For the analysis of the expression of individual genes at the mRNA and protein level was used qRT-PCR and Western blot. Total cholesterol levels in plasma and livers were determined by biochemical analysis.

Results:

The increase of cholesterol levels in plasma and liver and changes in the expression of the respective proteins and genes at mRNA level were caused only by HFD. High plasma levels of sENG in combination with high-fat diet did not significantly affect hepatic cholesterol metabolism or the expression of the cholesterol hepatic transport mechanisms.

Conclusions:

Elevated sENG levels in combination with a high fat diet did not affect liver cholesterol metabolism.

