Abstract

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Title of diploma thesis: Alternation of bile production due to iron depletion

Introduction: Liver has an irreplaceable role in the production and secretion of bile. This body fluid serves as the main excretion way of some endogenous and exogenous substances. Another liver property is the ability to store substances essential for correct functions of the body, e.g. iron. It has been shown that iron could have an impact on the bile production and secretion.

Aim: The aim of this diploma thesis was to discover an impact of iron depletion on the bile synthesis and metabolism, especially on bile acids, and the way it affects transporters expression.

Methods: Male Wistar rats (n=6 in each group, 250 ± 20 g) were divided into two groups: control group (Chow diet) fed with standard diet and iron depletion group (ID), fed with iron depletion diet for 21 days. To investigate the changes in bile flow, the bile had been collected for 120 min during *in vivo* clearance study. The analysis of the changes in expression of bile transporters and enzymes responsible for *de novo* bile acid synthesis was performed at the mRNA (qRT-PCR) and protein (Western blot) levels.

Results: Iron depletion led to the increase of bile flow in rats. The effect was caused by up-regulation of enzymes involved in bile acid *de novo* synthesis. However, there were no changes in the expression of the main apical tranporters (Bsep, Mrp2), but the up-regulation of basolatral transporter for bile acids (Ntcp) was observed.

Conclusions: The results from this study have shown that iron depletion in rats has choleretic effect. This effect is probably caused by up-regulation of enzymes involved in bile acid *de novo* synthesis, nevertheless without any changes in expression of the transporters.

Keywords: iron, bile acids