Abstract

Charles University in Prague

Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Bilirubin influence on the progression of inflammatory bowel disease

Diploma thesis

Anna Patková

Supervisor: doc. PharmDr. Petr Nachtigal, Ph.D.

Background: Inflammatory bowel diseases, including Crohn's disease and ulcerative colitis, are chronic inflammatory disorders of the gut caused by an interaction of genetic and environmental factors. It is thought that tissue damage is also partly caused by an oxidative stress. Heme oxygenase-1 and bilirubin are strong antioxidants and both of them provide an anti-inflammatory effect in various tissues. The aim of this diploma thesis was to detect changes of expression of HO-I in the large intestine of normobilirubinemic and hyperbilirubinemic rats after the induction of acute or chronic experimental colitis.

Methods: We used Gunn rats with hereditary defect of UDP-glucuronyltransferase, which causes hyperbilirubinemia. The control group of animals was made up of heterozygous littermates of the Gunn rats, which have normal serum bilirubin levels. All animals were treated by dextran sulfate sodium in order to induce an experimental colitis. Rats were divided into two groups. Each of them contained hyperbilirubinemic and normobilirubinemic animals. The acute colitis was induced in the first group and the chronic colitis was induced in the second one (DSS was administered in cycles). The expression of HO-I was detected by imunohistochemical methods.

Results: Imunohistochemical analysis showed expression of HO-I in the large intestine of rats. Expression of HO-I was detected mainly in *tunica mucosa* in all studied groups of animals. The strong expression was found mostly in epithelial cells, especially on the surface of luminal side of the intestine.

Conclusion: Administration of DSS did not result in any changes in expression of HO-I in studied animal groups. These changes were not observed even in comparison of acute and

chronic model of colitis. Different levels of serum bilirubin did not affect the expression of HO-I as well.