

Iron is an essential element for human organism, because it cooperates as a cofactor of enzymes in many metabolic pathways. Iron is a component of hemoglobin, and thus it is indispensable for the oxygen transport to tissues. It can exist as a ferrous or ferric form. However, ferrous iron participates in reactions in which highly reactive hydroxyl group can be formed. This product is harmful for the organism. Non-heme iron is taken up to the circulation through duodenal enterocyte. Iron excretion is carried out only by desquamation of the enterocytes or by bleeding. Therefore, iron intake must be strictly regulated. Iron overloading is observed in some chronic diseases (hereditary hemochromatosis, alcohol liver disease). In contrary, iron depletion can be a case of iron deficiency anemia. The aim of this master thesis is to determine the expression of iron transport molecules in duodenum in chronic diseases which originate due to disturbances of iron intake regulation. We determine the expression of molecules of iron transport (DMT1, Dcytb, ferroportin, hephaestin) on mRNA level by qPCR and on protein level by western blot. The level of serum hepcidin was determined by ELISA. Our results show an increased expression of mRNA of transporters DMT1 and ferroportin as well as ferrireductase Dcytb and ferroxidase hephaestin in the group of iron deficiency anemia. We observed no differences of the expression on the level of proteins. We suggest, that the expression on the mRNA level do not correspond with the expression on the protein level. We compared the levels of protein expressions with the level of active hepcidin obtained from patients' sera. No important dependences were observed. We assume, that there could be another regulation mechanisms in protein expression, that direct iron intake, but are still uncovered. The master thesis is a part of bigger study, in which the author participated by determining protein expressions, by genotyping HFE gene and by isolating as well as by measuring RNA concentration. All results of the study are mentioned in this master thesis and author's data are discussed in relation to this results.