EXCESSIVE IRON ACCUMULATION – REAL THREAT TO HUMAN HEALTH?

Summary

Human health depends on the proper content of iron in the body. In the absence of mechanisms regulating the excretion of iron, which allow the adjustment of endogenous resources to the demand for it, accumulation of iron can become a real threat to the proper functioning of many organs. In humans, iron overload may have different origin: innate, genetically determined or acquired. Hereditary hemochromatosis is a disease with a rich clinical symptomatology, which develops due to the gradual accumulation of iron in the parenchymal cells of many organs (liver, pancreas, heart, gonads, pituitary gland), and leads to their progressive damage. Mutations of five different genes, encoding proteins and peptides regulating iron homeostasis, form the genetic basis of this disease. Among them, over 80% of cases of hereditary hemochromatosis in Caucasian populations are associated with the HFE gene mutations. Excessive iron accumulation may also develop secondary to other diseases, congenital or acquired. Iron overload is diagnosed in chronic anemia requiring multiple transfusions and may accompany some chronic liver diseases, including chronic viral hepatitis C, non-alcoholic fatty liver disease, alcoholic liver disease and hepatic porphyrias. Many studies are devoted to the analysis of links between the pathological iron accumulation and morbidity. The association of carcinogenesis mechanisms with dysregulation of iron homeostasis seems to be especially interesting. Results of population studies bring some evidence for increased risk of development of certain cancers related to iron overload.