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Haptoglobin polymorphism causes neurodegenerative changes through oxidative stress

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Abstract

Human gene of haptoglobin is presented by two alleles. Haptoglobin types are 1-1, 1-2 and 2-2. Different studies shows role of type 2-2 in cardio-vascular disease occurrence during diabetes. Haptoglobin type 1 is known to suppress hemoglobin based oxygenation of HDL and LDL, acting like antioxidant. We aimed that Bulgarian population is haptoglobin 2-2 type, which causes frequent morbidity by systematic diseases, such as atherosclerosis, diabetes, diabetic nephropathies, gestational diabetes, anemia, etc. 37 volunteers were included, age 33.9 ± 4.1. IMT, ABI, CBC, iron homeostasis, hsCRP and haptoglobin type were evaluated. Increased serum hepcidin concentrations were established in patients with atherosclerotic a. carotis changes (99.1 ± 10.8 µg/L) compared to healthy controls (20.2 ± 2.9 µg/L), P<0.001. In haptoglobin type 2-2, was found strong positive correlation between hepcidin levels and changed IMT and ABI (r=0.911, r=0.935, resp.; P<0.05). Three volunteers were with haptoglobin type 2-1; no changes of serum hepcidin concentration and IMT, ABI was found in this phenotype. The main reason for acute coronary thrombosis is atherosclerotic plaque rupture. Extra-vascular hemoglobin plays role as start mechanism for inflammation in the plaques. Important contra-active mechanism is played by haptoglobin. Thus, it prevents kidney injury from free hemoglobin. Released iron from destructed erythrocytes forms reactive oxygen radicals through Fenton's reaction. Hepcidin regulates iron homeostasis by its interaction with intracellular iron exporter ferroportin.

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Keywords—oxidative stress, haptoglobin, iron

Biography

Victor Manolov has completed his PhD at Medical University in Sofia, Bulgaria. He is working as Assist. Prof. at Department of Clinical laboratory and clinical immunology at the same University. His interests are in neurology, pediatrics, gynecology, endocrinology and clinical laboratory. He has published more than 25 papers in reputed journals.

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