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## Hepcidin quantification in Neurodegenerative diseases

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**Aim:** Neurodegenerative diseases are conditions in which the nervous system progressively and irreversibly deteriorates. Neurodegenerative diseases are often late manifestation of disorders typified by Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD) and amyotrophic lateral sclerosis (ALS). AD depends on age, is chronic disease, a leading cause for dementia. Brain atrophy is main sign in AD cases. PD is another neurodegenerative disease, and also usually involves elder people. HD is characterized by abnormal involuntary writhing movements called chorea. We aimed to find a connection between iron homeostasis regulator hepcidin and neurodegenerative diseases patients.

**Materials and Methods:** 17 patients with Huntington's disease, 23 with Alzheimer's and 19 with Parkinson's disease were included; 31 females (52.5%). They had clinical and neurological examination, EMG. They were evaluated for routine biochemical parameters, and additional serum hepcidin and glutathione peroxidase (GPX) were quantified. Hepcidin and GPX were evaluated by ELISA methods. The results obtained from HD, AD and PD patients were compared to age and gender matched healthy controls. Statistical analysis of established results was performed using Pearson's correlation and Student's paired t-test.

**Results:** We found statistically significant elevated serum hepcidin levels in HD patients compared to healthy controls ( $51.6 \mu\text{g/L} \pm 10.2 \mu\text{g/L}$ ;  $20.4 \mu\text{g/L} \pm 4.9 \mu\text{g/L}$ ;  $P < 0.001$ ). In AD and PD cases we found also increased serum hepcidin ( $61.4 \mu\text{g/L} \pm 12.3 \mu\text{g/L}$ ; and  $54.9 \mu\text{g/L} \pm 5.7 \mu\text{g/L}$ ), compared to controls ( $P < 0.001$ ). GPX activity was decreased in HD patients compared to control group ( $7.8 \text{ pg/mL} \pm 1.9 \text{ pg/mL}$ ;  $35.8 \text{ pg/mL} \pm 11.9 \text{ pg/mL}$ ;  $P < 0.005$ ). In AD and PD cases we found also decreased GPX levels ( $8.4 \text{ pg/mL} \pm 2.2 \text{ pg/mL}$ ;  $8.9 \text{ pg/mL} \pm 1.4 \text{ pg/mL}$ ), compared to controls ( $P < 0.05$ ).

**Conclusion:** Because of increased concentration of metals passing blood-brain barrier (BBB) in connectivity of neuronal medium with blood vessels. This makes the brain more likely to develop neurodegeneration. Serum hepcidin quantification might be a new biomarker for early HD, AD and PD diagnosis.

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