Effect of chronic mild stress on the expression of hepcidin gene in hippocampus of male rats

Farajdokht F (MSc), Soleimani M (PhD), Mehrpouya S (MSc), Barati M (MSc), Nahavandi A (PhD)*

Abstract

Background and Objective: The first effect of stress on the immune system is usually a rapid increase in function which manifests itself by an increase in the number of inflammatory cytokines in blood. It is however, followed by a decrease of function in immunological response. During inflammation, the expression of hepcidin gene is increased in order to keep iron away from pathogens. This study was conducted to determine the effect of chronic mild stress on the expression of hepcidin gene in the hippocampus of the male adult rats.

Materials and Methods: This experimental study was carried out on 30 adult male Wistar rats, weighing approximately 200-250 grams. They were randomly allocated into two groups of 15 rats: control and chronic mild stress group. Animals in intervention group were exposed to chronic mild stress for 3 weeks. At the end of the stress protocol, 2 ml blood sample was collected to measure the serum concentration of IL-6. Real time PCR method was used to investigate hepcidin expression in hippocampus. Data were analyzed using SPSS-16 and independent t-test.

Results: The mean level of IL-6 was significantly higher in the CMS exposure group (27.98±0.84 pg/ml) than control group (18.29±1.18 pg/ml) (P<0.05). Hepcidin expression in the hippocampus of intervention group was significantly higher (2.69±0.226%) in compared to control group (1±0.105) (P<0.001).

Conclusion: This study showed that chronic mild stress increases the expression of hepcidin gene and the serum level of IL-6 in adult rats.

Keywords: Stress, Hepcidin, Hippocampus, IL-6

* Corresponding Author: Nahavandi A (PhD), E-mail: arezo1999@gmail.com

Received 25 February 2012 Revised 28 August 2012 Accepted 8 October 2012