Original Paper

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

Farajdokht F (MSc)[1], Soleimani M (PhD)[2], Mehrpouya S (MSc)[3] Barati M (MSc)[4], Nahavandi A (PhD)*[5]

[1]PhD Candidate in Physiology, Physiology Research Center, Tehran University of Medical Science, Tehran, Iran. [2]Assistant Professor, Department of Anatomy, Cellular and Molecular Research Center, Tehran University of Medical Science, Tehran, Iran. [3]MSc Student in Physiology, Physiology Research Center, Tehran University of Medical Science, Tehran, Iran. [4]PhD Candidate in Biotechnology, Cellular and Molecular Research Center, Tehran University of Medical Science, Tehran, Iran. [5]Assistant Professor, Department of Physiology, Physiology Research Center, Tehran University of Medical Science, Tehran, Iran.

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 hepcidingene 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

This paper should be cited as: Farajdokht F, Soleimani M, Mehrpouya S, Barati M, Nahavandi A. [Effect of chronic mild stress on the expression of hepcidin gene in hippocampus of male rats]. J Gorgan Uni Med Sci. 2013; 15(2): 42-46. [Article in Persian]