The 2nd International Neuroinflammation Congress and 2nd Student Festival of Neurosience

Shefa Neuroscience Research Center, Tehran, Iran, 17-19 April, 2018

The Neuroscience Journal of Shefaye Khatam

Volume 6, No. 2, Suppl 1

Poster Presentation

Hesperetine Nanoparticles Ameliorate Glial Activation and Reduce Demyelination Llevel of Rat Optic Chiasm in Lysolecithin-Iinduced Demyelination Model

Saeideh Baradaran[1*], Akbar Hajizadeh Moghaddam[1], Maryam Ghasemi-Kasman[2, 3]

[1]Department of Biology, Faculty of Basic Sciences, University of Mazandaran, Mazandaran, Iran

[2]Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

[3]Neuroscience Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Published: *17 April, 2018*

Abstract

Multiple sclerosis (MS) is one of the most autoimmune neurological and inflammatory disease in worldwide. Demyelination and disturbance of action potential conductance are regarded as main signs of MS disease. Hesperetin (Hst) is one of the flavonoid that have neuroprotective properties. The present study attempts to evaluate the effects of hesperetin or its nanoparticle on myelin repair and glial activation in lysolecithin (LPC) -induced demyelination model. Local demyelination was induced by administration of LPC (1%, 2µL) into the rat' optic chiasm. Animals have received oral administration of Hst or nano-Hst at dose of 20 mg/kg for 14 and 21 days post lesion. Visual evoked potential (VEPs) records were performed on days 0, 7, 14 and 21 post lesions. Immunostaining against Iba 1 (microglia marker) and GFAP (astrocytes marker) were carried out for evaluation of myelination and astrocytes activation. Electrophysiological evidence emphasize that oral administration of hesperetin and nano-hespretin could reduce the P1-N1 latency and increase the amplitude of VEPs waves compared to the saline and Hst groups ($p \leq 0.001$). Immunos taining showed that myelin repair was improved in animals which have received nano-Hst treatment; In addition, nano-hesperetin and its nanoparticle effectively reduced the expression of GFAP in optic chiasm ($p \leq 0.001$). The extent of demyelination was reduced in animals under treatment of hesperetin) $p \leq 0.01$ (or nanohesperetin($p \leq 0.001$). Our results showed hesperetin and nano-hesperetin treatment significantly enhances myelin restoration through endogenous sources of glial progenitor cells following local injection of LPC.

Keywords: Optic Chiasm, Lysolecithin, Demyelination, Nano-Hesperetin, Myelin Repair, Glial Activation

Corresponding Author: Saeideh Baradaran

E-mail: *baradaran.phi95@gmail*