

In vivo assessment of optic chiasm associated with Hesperetin in demyelination model

Short title: Repair process in demyelinated-optic chiasm

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Introduction: Demyelination and disturbance of action potential conductance are regarded as main signs of Multiple Sclerosis. More than 70 percent of patients show visual disturbance in the first steps. Hesperetin (Hst) is one of the flavonoid has neuroprotective, anti-inflammatory properties. The aim of this study was to evaluate effects of Hesperetin on latency of visual signals, demyelination levels, glial activation, and expression of Olig2 and MBP in lysolecithin (LPC)-induced animal model.

Methods: Focal demyelination was induced by injection of LPC (1%, 2 μ L) into the rat optic chiasm. Animals received oral administration of Hst at dose of 20 mg/kg for 14 or 21 days post LPC injection. 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. Marker gene expression analyzed using Real time PCR as well as the extent of demyelination area was evaluated by Fluoro myelin staining.

Results: Electrophysiological evidence emphasizes that oral administration of hesperetin could reduce the P1-N1 latency of VEPs waves. Expression levels of the Olig2 and MBP were also significantly increased in Hesperetin treated rats. Immunostaining results confirmed histological data and showed that myelin repair improved in animals have received Hesperetin treatment .

Conclusions: our data suggest that Hesperetin reduces the latency of visual signals and significantly enhances myelin restoration through endogenous sources of glial progenitor cells following local injection of LPC.

Keywords: Optic chiasm; Lysolecithin; Demyelination; Hesperetin; Myelin repair; Glial activation; gene expression

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