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Anti-inflammatory effect of Shikonin on cultured astrocytes derived from rat brain

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Introduction: Astrocytes are more abundant cell type within the central nervous system with a population of 5 fold than the neurons and necessary for normal function of the brain. They reflect to brain injury by inflammatory action, thus they can play roles in many neurodegenerative diseases. More than morphological alternation, astrocyte activation is accompanied by acute and chronic inflammation related potentially cytotoxic molecules release such as NO, ILs, PGs and TNF-α. Essential component of Lithospermum erythrorhizon, shikonin is known to have anti-inflammatory, anti HIV-1, anti cancer and anticoagulant effects. Present study is to search the anti-inflammatory effects of Shikonin at different concentrations around (0.1 to 10 μM) on the cultured astrocytes.

Methods: Brains of 2 days rat infants were derived and then ho-

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mogenized after meninges removal, homogenizes were cultured in DMEMF12+10%FBS medium. 10 days later astrocytes were harvested and re cultivated for more purifications to 95% (using Immunocytochemistry method) to employ for tests. They were treated one hour by different concentrations of shikonin and then affected by LPS. To assess inflammation progress, NO concentrations (test of Griess) were assessed after 24 and 48 hours.

Results: Shikonin concentration of (1, 2.5, 5 and 10μM) had no significant anti-inflammatory effect but at (0.1 and 0.5μM) showed a significant anti- inflammatory effect and ability to reduce NO production by astrocytes ($p<0.0001$).

Conclusion: Anti-inflammatory effects of shikonin for mentioned concentrations on the astrocytes may be due to the inhibition of release and expression of inflammatory and cell signaling factors such as IL-6 and iNOS. Present findings can tend attentions toward shikonin as a plant originated drug and a new strategy to cure inflammatory neurodegenerative disorders.

Key words: Astrocytes, Inflammation, Shikonin, Neurodegenerative disease, NO.