

ABSTRACT

THE INHIBITION OF SYNAPTOGENESIS BY BACLOFEN IN THE DEVELOPMENT OF ANTIINFLAMMATORY PAIN

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Inflammatory pain can be defined as a body's protection mechanism due to tissue damage caused by inflammation and as an individual unpleasant experience. Long term inflammatory pain leads to chronic pain. Pathophysiologic approach of pain involves an activation of *N-Methyl-D-Aspartate* receptor by glutamate cause in increasing the Ca^{2+} influx in postsynaptic membrane, activate the central nervous system and if occur in long period can lead to synaptic plasticity. Hence, this research, using baclofen as GABA_B receptor agonist, was expected to reduce the synaptic plasticity.

This research was aimed to observe the effect of baclofen in synaptogenesis inhibition and the relation of synaptogenesis process to inflammatory pain behaviors. Mice were randomized in five groups with seven mice in each. Inflammation model was made by injecting Complete Freund's Adjuvant (CFA) on foot pad once. Then, mice were injected different dosage of baclofen 1, 5 and 10 nmol intrathecally. To evaluate the inflammation, foot-pad's thickness was measured. Pain response was evaluated by thermally stimulation using hot plate at $50 \pm 0.5^\circ C$.

Result shows that subjects had experienced inflammation since the first day after CFA injection, signed by hyperalgesia and elevation in foot-pad's thickness. Intrathecally baclofen 1 nmol ($p = 0.002$) and 5 nmol ($p = 0.023$) at day 12 and 10 nmol ($p = 0.035$) at day 11 after CFA injection was significantly reduce the pain sensation but not in depressing the foot-pad's thickness compare to CFA-induced mice. Inflammation also leads to the morphological changes in spinal cord and alters the number of inflammation cell. Regarding to synaptogenesis process, it is significantly different between the placebo with CFA-induced ($p < 0.001$) and baclofen 10 nmol-injected mice. Intrathecally baclofen at given dosage ($p < 0.001$) also reduce the synaptogenesis process compare to CFA-induced mice. It is proposed that synaptogenesis alters the inflammatory pain behavior in mice and administration of baclofen increase the latent time in mice.

Keywords : Inflammatory Pain, Complete Freund's Adjuvant, Baclofen, Synaptogenesis.