ABSTRACT

Effect of MK-801 the Noncompetitive Antagonist of NMDA Receptor on Decreasing Neuropathic Pain in Mice (*Mus musculus*) with Ligation Induction Model

Neuropathic pain could be defined as a condition associated with the damage of peripheral and central nervous system. In this condition, pain sensation is even obtained by the stimulus which doesn't normally provoke pain (allodynia) and an increased response occurs to a stimulus which is normally painful (hyperalgesia). Pathophysiologic of pain particularly involves the activation of ionotropic NMDA (N-methyl D-aspartate) receptor in the central nervous system caused by excessive release of glutamate. Hence, this research used noncompetitive antagonist NMDA receptor MK-801 which is expected to be a selective and specific analgesic.

This research was a true experimental study, pretest-posttest control group design using mice (*Mus musculus*) as a subject. Mice were randomized in seven groups with seven mice in each group. Neuropathic pain model was made by tight ligation of sciatic nerve on ipsilateral site, or it's known as PSNL (Partial Sciatic Nerve Ligation). Then, mice were given MK-801 with different dosage 0,01; 0,10; 1,00; 10,00; 20,00 nmol intrathecally in each group. Pain responses were evaluated by giving heat stimulation on the warm plate ($48\pm0,5^0$C).

Results showed that subjects have experienced neuropathic symptoms like hyperalgesia since third day after ligation. Usage of MK-801 at given dosages showed the effectiveness in blockade a pain sensation significantly ($p<0,001$) than placebo. Histochemistry with HE stained of spinal cord showed some morphologic alteration between sham operated group and ligated grup, also between subjects which received placebo and MK-801 with dosage 0,01; 1,00; 20,00 nmol.

Keywords : Neuropathy, NMDA Receptor, Glutamate, MK-801, PSNL (Partial Sciatic Nerve Ligation)