Pengaruh Pemberian Antagonis Reseptor N-Metil-D-Aspartat (NMDA) Mk-801 Terhadap Penurunan Sensasi Nyeri Inflamasi pada Mencit Putih (Mus Musculus) Strain Balb/C

Abstrak:
Chronic pain, such as inflammatory pain, is difficult to manage. N-Methyl-D-Aspartate (NMDA) receptor is a key molecule involved in the pain pathway and sensitization. The present study was designed to investigate the efficacy of a novel potent non-competitive NMDA receptor antagonist, MK-801, in relieving inflammatory pain in mice. A model of inflammatory pain state was induced by intraplantar injection of Complete Freunds Adjuvant (CFA). NMDA receptor antagonist MK-801 was administered intrathecally once a day for 7 consecutive days at 0.01, 0.10, 1.00, 10.00, or 20.00 nmol doses a week after CFA injection. Thermal hyperalgesia was measured on days 0, 1, 3, 5, 7, 8, 10, 12, 14, and 21 after CFA injection by warm plate. Paw thickness at the ipsilateral site was also measured on days 0, 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, and 21 after CFA injection. Histology of the spinal cord tissue was examined by light microscope following haematoxyline-eosin staining. The results showed that MK-801 given at 0.01-20.00 nmol dosage significantly increased mice latency on thermal stimulation compared with placebo (p<0.001). Paw thickness was also significantly decreased to compare with placebo after intrathecal injection of MK-801 at 0.01, 1.00, and 10.00 nmol dosage (p<0.001; p=0.005; p=0.015 respectively). Whereas MK-801 administration at 0.01, 1.00, and 20.00 nmol could decrease the inflammatory cells infiltration and recover the dorsal horn histology compare with placebo. Taken together, these results show that NMDA receptor antagonist, MK-801, is effective in relieving inflammatory pain.

Keyword:
Chronic pain, Inflammatory pain, MK-801, NMDA receptor