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INHIBITION OF THE MITOGEN ACTIVATED PROTEIN KINASE (MAPK) IN THE INFLAMMATORY PAIN LIKE STATE USING SB 203580 AND PD 98059 IN MICE

Abstract

The therapeutic management of pain related inflammation is difficult to handle. The inflammatory process is mediated through the mitogen-activated protein kinase (MAPK) signal transduction pathway. Inhibition of this signal with specific inhibitors of p38 and Erk 1/2 MAPK pathway i.e. SB 203580 and PD 98059 has been reported. This study was aimed to assess the effectiveness of those specific inhibitors for inflammatory pain management in Balb-c mice. Inflammatory model was developed by intraplantar injection of Complete Freud’s Adjuvant (CFA). PD 98059 and SB 203580 were dissolved in 30% DMSO to acquire concentration of 10.0 nmol, then was diluted to obtain doses of 0.1; 1.0 and 5.0 nmol. The intrathecally administered of SB 203580 and PD 98059 was injected once a day for 7 consecutive days at dose of 0.1, 1.0 and 5.0 mmol that was started from day 7 to day 13 after CFA injection. The control group received 10 µl 30% DMSO. Hyperalgesia was measured on day 0, 1, 3, 5, 7, 8, 10, 12, and 14 following CFA injection. At dose of 5.0 nmol, PD 98059 increased mice’s latency time to heat stimulation compared with placebo ($F_{(3,26)}=6.881; p=0.001$). Also, SB 203580 at dose of 0.1, 1.0 and 5.0 showed similar results compared with placebo ($F_{(3,26)}=4.394; p=0.002, p=0.001$ and $p=0.039$ for doses 0.1, 1.0 and 5.0 nmol respectively). MAPK inhibitors such as PD 98059 and SB 203580 can decrease hyperalgesia which is shown by increasing response time toward heat stimuli, so that MAPK inhibitors could have a place of therapy in the inflammatory pain like state due to its effectiveness in decreasing hyperalgesia.

Keyword : Inflammatory, pain, mitogen, activated, protein, kinase, PD, 98059, SB, 203580, chronic, pain

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