

论著

鞘内注射SB203580对神经病理性疼痛大鼠脊髓背角环氧合酶-2表达的影响

王刚^{1,2}, 黄长盛¹, 王懿春³, 郭曲练¹, 蒋海鹰⁴, 文继舫⁴

1. 中南大学湘雅医院麻醉科, 长沙 410008;
2. 湖南澧县人民医院麻醉科, 湖南 澧县 415500;
3. 湖南省肿瘤医院麻醉科, 长沙 410013;
4. 中南大学湘雅医学院病理学系, 长沙 410078

摘要: 目的: 探讨鞘内注射p38丝裂原蛋白激酶(p38MAPK)特异性抑制剂SB203580对大鼠慢性压迫性损伤(CCI)术后脊髓背角环氧合酶-2 (COX-2)蛋白表达的影响。方法: 鞘内置管成功的SD雄性大鼠24只, 随机分为4组: Sham组、NS组、DMSO组和SB组, 其中Sham组做假手术, 后3组大鼠右侧坐骨神经建立CCI模型。模型成功后, 术后第6天开始分别鞘内注射生理盐水、2%二甲亚砜、SB203580, 每天2次, 连续5 d。术前1 d、术后第1, 3, 5, 7, 9, 11天测定机械性痛阈。术后第11天测定机械性痛阈后处死大鼠, 取脊髓腰膨大进行免疫组织化学分析测定COX-2蛋白表达。结果: 与术前相比, Sham组术后机械性痛阈无明显改变($P>0.05$), NS组和DMSO组在术后第1至11天机械性痛阈降低($P<0.05$), SB组在术后第1至5天机械性痛阈降低($P<0.05$), 与NS组和DMSO组比较, SB组在术后第7至11天, 机械性痛阈增加($P<0.05$); 免疫组织化学分析, NS组和DMSO组脊髓背角COX-2蛋白阳性细胞数和阳性评分均高于Sham组($P<0.05$), SB组COX-2蛋白阳性细胞数和阳性评分低于NS组和DMSO组($P<0.05$)。结论: 鞘内注射SB203580可使神经病理性疼痛大鼠产生明显镇痛效应; 可减少神经病理性疼痛大鼠脊髓背角COX-2蛋白的表达, p38MAPK参与COX-2蛋白表达的调节。

关键词: 鞘内注射 神经病理性疼痛 p38丝裂原活化蛋白激酶 环氧合酶-2

Changes in expression of cyclooxygenase-2 in the spinal dorsal horn after intrathecal p38MAPK inhibitor SB203580 on neuropathic pain in rats

WANG Gang^{1,2}, HUANG Changsheng¹, WANG Yichun³, GUO Qulian¹, JIANG Haiying⁴, WEN Jifang⁴

1. Department of Anesthesiology, Xiangya Hospital, Central South University, Changsha 410008;
2. Department of Anesthesiology, Lixian People's Hospital of Hunan Province, Lixian Hunan 415500;
3. Department of Anesthesiology, Hunan Provincial Tumor Hospital, Changsha 410013;
4. Department of Pathology, Xiangya School of Medicine, Central South University, Changsha 410078, China

Abstract: Objective: To investigate the changes of cyclooxygenase-2 (COX-2) expression in the spinal cord dorsal horn after intrathecal a specific p38MAPK inhibitor—SB203580 on neuropathic pain in rats induced by chronic constrictive injury (CCI) to the sciatic nerve. Methods: Twenty-four male SD rats after intrathecal catheter placement were randomly divided into 4 groups: a sham group with sham surgery, the neuropathic pain model of a NS group, a DMSO group and an SB group were established by CCI to sciatic nerve. NS or DMSO or SB203580 was injected IT NS or 2%DMSO or SB203580 twice a day for 5 consecutive days starting at 6th day when the model of chronic constrictive injury was established. Mechanical stimuli were measured before the surgery and on 1st, 3rd, 5th, 7th, 9th, and 11th day after the surgery. Then all rats were sacrificed and the lumbar segment of spinal cord was removed to determine the COX-2 expression in the dorsal horn by immunocytochemistry.

Results: Day 1 to 11 after the surgery, the threshold to mechanical on the surgery side was significantly lower in the NS group and the DMSO group than in the sham group. Day 7 to 11 after the surgery, the threshold to mechanical on the surgery side was significantly lower in the SB group than in the NS group and the DMSO group. The expression of spinal COX-2 was higher in the NS group and the DMSO group than in the sham group, but lower in the SB group than in NS group and the DMSO group.

Conclusion: Intrathecal administration of SB203580 has significant analgesic effect in the

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CCI rat model. Expression of COX-2 is significantly reduced when p38MAPK is inhibited by intrathecal SB203580, and p38MAPK stimulation is essential for COX-2 expression.

Keywords: intrathecal injection neuropathic pain p38 mitogen activated protein kinase cyclooxygenase-2

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通讯作者: 郭曲练,Email:qulianguo@hotmail.com

作者简介: 王刚,硕士,副主任医师,主要从事临床麻醉和慢性疼痛的研究。

作者Email: qulianguo@hotmail.com

参考文献:

1. Ji RR, Suter MR. p38 MAPK, microglial signaling, and neuropathic pain [J]. *Mol Pain*, 2007, 3: 33.
2. Suzuki T, Hide I, Ido K, et al. Production and release of neuroprotective tumor necrosis factor by P2X7 receptor-activated microglia [J]. *J Neurosci*, 2004, 24(1): 1 - 7.
3. Wu J, Xu Y, Pu S. p38/MAPK inhibitor modulates the expression of dorsal horn GABA(B) receptors in the spinal nerve ligation model of neuropathic pain [J]. *Neuroimmunomodulation*, 2011, 18(3): 150-155.
4. Lee KM, Jeon SM, Cho HJ. Interleukin-6 induces microglial CX3CR1 expression in the spinal cord after peripheral nerve injury through the activation of p38 MAPK [J]. *Eur J Pain*, 2010, 14(7): 682.e1-12.
5. Takahashi M, Kawaguchi M, Shimada K, et al. Cyclooxygenase-2 expression in Schwann cells and macrophages in the sciatic nerve after single spinal nerve injury in rats [J]. *Neurosci Lett*, 2004, 363(3): 203-206.
6. 范隆, 王国林. 大鼠蛛网膜下腔微创置管方法 [J]. *天津医科大学学报*, 2005, 11(2): 165-167.
- FAN Long, WANG Guolin. Development of catheterization for subarachnoid space in rats [J]. *Journal of Tianjin Medical University*, 2005, 11(2): 165-167.
7. Bennett GJ, Xie YK. A peripheral mononeuropathy in rat that produces disorders of pain sensation like those seen in man [J]. *Pain*, 1988, 33(1): 87.
8. 张飞娥, 张励才, 贾晋太. 神经病理性疼痛大鼠鞘内注射SB203580的镇痛作用 [J]. *中华麻醉学杂志*, 2006, 26(4): 356-359.
- ZHANG Fei'e, ZHANG Licai, JIA Jintai. Analgesic effect of Intrathecal SB203580 in a rat model of neuropathic pain [J]. *Chinese Journal of Anesthesiology*, 2006, 26(4): 356-359.
9. Vivancos CG, Verri WA Jr, Cunha TM, et al. An electronic pressure-meter nociception paw test for rats [J]. *Braz J Med Boil Res*, 2004, 37(3): 391-399.
10. Soslow RA, Dannenberg AJ, Rush D, et al. COX-2 is expressed in human pulmonary, colonic, and mammary tumors [J]. *Cancer*, 2000, 89(12): 2637-2645.
11. Jana M, Dasgupta S, Saha RN, et al. Induction of tumor necrosis factor-alpha (TNF-alpha) by interleukin-12 p40 monomer and homodimer in microglia and macrophages [J]. *J Neurochem*, 2003, 86(2): 519-528.
12. Wilms H, Rosenstiel P, Sievers J, et al. Activation of microglia by human neuromelanin is NF-kappaB dependent and involves p38 mitogen-activated protein kinase: implications for Parkinson's disease [J]. *FASEB J*, 2003, 17(3): 500-502.
13. Sung CS, Wen ZH, Chang WK, et al. Inhibition of p38 mitogen-activated protein kinase attenuates interleukin-1beta-induced thermal hyperalgesia and inducible nitric oxide synthase expression in the spinal cord [J]. *J Neurochem*, 2005, 94(3): 742-752.
14. Hudmon A, Choi JS, Tyrrell L, et al. Phosphorylation of sodium channel Na(v)1.8 by p38 mitogen-activated protein kinase increases current density in dorsal root ganglion neurons [J]. *J Neurosci*, 2008, 28 (12): 3190-3201.