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瑞芬太尼痛觉过敏小鼠中脑导水管周围灰质Mu 阿片受体和神经元限制性沉默因子表达水平的变化

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Changes of Mu-opioid receptor and neuron-restrictive silencer factor in periaquductal gray in mouse models of remifentanil-induced postoperative hyperalgesia

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摘要

目的：观察瑞芬太尼痛觉过敏小鼠中脑导水管周围灰质(periaquductal gray，PAG)中Mu阿片受体(Mu-opioid receptor，Mor)和神经元限制性沉默因子(neuron-restrictive silencer factor，NRSF)表达水平的变化。方法：32只小鼠采用随机数字表法随机分入4组(n=8)：对照组(C组)、切口痛组(I组)、瑞芬太尼组(R组)和切口痛+瑞芬太尼组(IR组)。采用Von Frey细丝和BME-410A型热痛刺激仪测量小鼠术前24 h和术后2，6，24，48 h的机械缩足反射阈值(paw withdrawal mechanical thresholds，PWMT)和热缩足反射潜伏期((paw withdrawal thermal latency，PWTL)。Western印迹检测术后48 h小鼠PAG中Mor和NRSF的表达水平。结果：与C组和术前基础值比较，I组、R组和IR组术后2~48 h PWMT和PWTL均显著降低(P<0.01)；术后2，6 h时R组较I组PWMT和PWTL略高(P<0.01)，术后24，48 h时两组间差异无统计学意义(P>0.05)；与I组比较，IR组术后PWMT和PWTL显著降低，并持续到术后48 h(P<0.01)。与C组和I组比较，R组和IR组Mor表达均显著降低(P<0.01)，NRSF表达显著升高(P<0.01)，C组和I组之间Mor和NRSF表达差异无统计学意义(P>0.05)。结论：术中短时程输注瑞芬太尼可诱导小鼠术后痛觉过敏，同时瑞芬太尼还诱导PAG中Mor水平降低及NRSF水平增加，该变化可能参与瑞芬太尼诱导的痛觉过敏的形成。

关键词 : 瑞芬太尼, 痛觉过敏, Mu阿片受体, 神经元限制性沉默因子

Abstract :

Objective: To determine the changes of Mu-opioid receptor (Mor) and neuron-restrictive silencer factor (NRSF) in periaquductal gray (PAG) in mouse models of remifentanil-induced postoperative hyperalgesia.
Methods: Thirty-two Kun-Ming mice were randomly divided into 4 groups (8 mice in each group): Group C (mice underwent a sham procedure and saline was infused subcutaneously over a period of 30 min), Group I (mice underwent a surgerical incision and the same volume of saline), Group R (mice underwent a sham procedure and remifentanil was infused subcutaneously at the moment of surgeical incision over a period of 30 min), and group IR (mice underwent a surgerical incision and remifentanil). Paw withdrawal mechanical threshold (PWMT) and paw withdrawal thermal latency (PWTL) tests were performed 24 h before the operation and 2, 6, 24, and 48 h after the operation. The specimens were collected after behavioral testings at 48 h. The expressions of Mor and NRSF in mice's PAG neurons were determined by Western blot.
Results: Mechanical allodynia and thermal hyperalgesia developed in Group I, R and IR (P<0.01). Intraoperative infusion of remifentanil enhanced mechanical allodynia and thermal hyperalgesia in mice with planta incision (P<0.01). In Group R and Group IR, the expression of Mor was significantly lower (P<0.01) and NRSF was significantly higher (P<0.01) when compared with Group C and Group I.
Conclusion: Intraoperative infusion of remifentanil induces postoperative hyperalgesia in mouse models, accompanied with decreased expressions of Mor and increased of NRSF level in PAG neurons, which may be involved in remifentanil induced hyperalgesia.

Key words : remifentanil　 hyperalgesia　 Mu-opioid receptor　 neuron-restrictive silencer factor

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