

论文

不同静脉麻醉药对大鼠结肠纵形肌收缩活动的影响

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摘要:

目的 研究咪达唑仑、丙泊酚、依托咪酯和氯胺酮对大鼠离体结肠远端纵形肌肌条收缩活动的影响及其可能的影响机制。方法 制备大鼠离体结肠纵形肌肌条, 随机分为对照组、非TTX组和TTX组, 对照组加入二甲亚砜(DMSO)5μL; 非TTX组直接加入不同累积浓度的咪达唑仑、丙泊酚、依托咪酯或氯胺酮; TTX组加入电压门控Na<sup>+</sup>通道阻滞剂河豚毒(TTX)10μmol/L阻断结肠内神经元动作电位的产生和传导后, 再分别加入不同累积浓度的静脉麻醉药, 加药方式同非TTX组。以平均肌张力变化为指标, 记录三组肌条收缩活动的变化。结果 对照组: DMSO对结肠肌条收缩张力无明显影响。非TTX组: 咪达唑仑、丙泊酚、依托咪酯和氯胺酮分别在药物累积浓度达到1×10<sup>-5</sup>、1×10<sup>-5</sup>、1×10<sup>-6</sup>和3×10<sup>-6</sup>mol/L时降低结肠远端纵形肌收缩幅度(P<0.05~0.01), 肌条张力降低幅度随药物浓度升高而加大。依托咪酯虽然在低浓度(1×10<sup>-6</sup>mol/L)时即可降低肌条自主收缩幅度, 但当浓度累积至1×10<sup>-4</sup>mol/L时, 与等浓度的咪达唑仑和丙泊酚相比, 其降低幅度却较小(P<0.05)。TTX组: 用电压门控Na<sup>+</sup>通道阻滞剂TTX预处理后, 咪达唑仑、丙泊酚和依托咪酯仍降低大鼠结肠远端纵形肌肌条收缩张力, 且与非TTX组相比, 降低幅度明显增大(P<0.05~0.01); 而氯胺酮非但不降低肌条收缩张力, 反而增高收缩张力。结论 咪达唑仑、丙泊酚、依托咪酯和氯胺酮均抑制大鼠结肠远端纵形肌自主收缩, 其机制可能与肠道平滑肌细胞收缩和肠神经系统活动有关。

关键词: 麻醉药, 静脉; 结肠; 动力; 大鼠, Wistar

Influence of different intravenous anesthetic agents on contraction of colonic longitudinal muscle in rats

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Abstract:

Objective To study the influence of midazolam, propofol, etomidate and ketamine on the contraction of colonic longitudinal muscle in rats. Methods Longitudinal muscle strips of colon were dissected from male Wistar rats and randomly divided into control group, TTX-free group and TTX group. Some strips were exposed to Krebs's solution with 1% DMSO (control group). Some other strips were incubated within Krebs's solution containing midazolam, propofol, etomidate and ketamine with (TTX group) or without (TTX-free group) tetrodotoxin pre-treatment. Isometric contraction of longitudinal smooth muscle strips was measured and recorded. Result 1% DMSO exerted no effect on the tension of colonic strips in control group. Midazolam, propofol, etomidate and ketamine at accumulating concentration of 1×10<sup>-5</sup> mol/L, 1×10<sup>-5</sup> mol/L, 1×10<sup>-6</sup> mol/L and 3×10<sup>-6</sup> mol/L decreased the tension of colonic strips in a concentration-dependent manner (P<0.05~0.01) in TTX-free group. Pre-treated with TTX, midazolam, propofol and etomidate all produced greater reduction of strip tension in TTX group than that in TTX-free group, while ketamine enhanced the strip tension in the presence of TTX. Conclusion Midazolam, propofol, etomidate and ketamine exhibit inhibitory effects on the spontaneous contractile activities of isolated colonic strips in rats. The contraction of smooth muscle cells and activity of enteric nervous system might be involved in this effect.

Keywords: Anesthetic agents, intravenous; Colon; Motility; Rats, Wistar

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