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论著

ATP通过P2受体调节大鼠近端结肠纵行肌的舒张与收缩反应

任雷鸣[1,2*], 王 秒[1]

(1. 河北医科大学药学院, 河北 石家庄 050017; 2. 河北化工医药职业技术学院, 河北石家庄 050031)

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摘要 目的 腺苷三磷酸（ATP）对大鼠离体远端结肠纵行肌运动的影响已明确，对近端结肠纵行肌的影响可能不同，但未有报告，为此对此进行观察并探讨其受体机制。方法 观察静息张力时或预收缩时0.1 μmol·L^{-1}～1 mmol·L^{-1} ATP和1～100 μmol·L^{-1}腺苷对大鼠近端结肠纵行肌的抑制和兴奋作用。结果 在静息张力下，1 μmol·L^{-1}～1 mmol·L^{-1} ATP对大鼠近端结肠纵行肌产生3种效应，即抑制自发性收缩反应，一过性轻度降低基础张力(0.05～0.08 g)，随后产生浓度依赖性收缩反应(0.04～0.44 g)。0.1 μmol·L^{-1}河豚毒素不影响ATP的上述作用。在静息张力下，1～100 μmol·L^{-1}腺苷对近端结肠纵行肌未产生明显的收缩反应。应用5-羟色胺(5-HT)或乙酰胆碱(ACh)预收缩标本时，1 μmol·L^{-1}～1 mol·L^{-1} ATP产生明显的浓度依赖性舒张反应(23.2%～94.6%, 5-HT预收缩; 24.8%～92.4%, ACh预收缩)，而腺苷引起的舒张反应明显小于ATP。结论 在大鼠离体近端结肠纵行肌，ATP主要通过嘌呤嘧啶(P)2受体介导收缩反应，部分通过P1受体介导舒张反应。

关键词 腺苷三磷酸 腺苷 受体,嘌呤 肌收缩 肌舒张 结肠

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Relaxation and contraction induced by ATP *via* P2 receptors in longitudinal muscle strips of the rat proximal colon

REN Lei-Ming[1,2*], WANG Miao[1]

(1. Department of Pharmacology, School of Pharmacy, Hebei Medical University, Shijiazhuang 050017, China; 2. Hebei Professional College in Chemical & Pharmaceutical Sciences, Shijiazhuang 050031, China)

Abstract

AIM Action of adenosine triphosphate(ATP) on longitudinal muscle strips of the rat distal colon has been reported, however, that of the rat proximal colon remains to be clarified. In this study we investigated the effects of ATP on longitudinal muscle strips isolated from the rat proximal colon and the receptors involved in the effects. **METHODS** Isometric relaxant and contractile responses to ATP (0.1 μmol·L^{-1}－1 mmol·L^{-1}) and adenosine (1－100 μmol·L^{-1}) in longitudinal muscle strips of the rat proximal colon were observed. **RESULTS** ATP (0.1 μmol·L^{-1}－1 mmol·L^{-1}) produced a complicated response including an inhibition of rhythmic contraction and a weakly transient decrease in basic tone (0.05－0.08 g) followed by a concentration-dependent contraction (0.04－0.44 g) in longitudinal muscle strips of the rat proximal colon at resting tension. Tetrodotoxin (0.1 μmol·L^{-1}) did not influence the responses to ATP. Adenosine (1－100 μmol·L^{-1}) did not produce an obvious contractile response in the preparation at resting tension. Concentration-dependent relaxant responses to ATP (1 μmol·L^{-1}－1 mmol·L^{-1}) in the preparation precontracted with 5-hydroxytryptamine or with acetylcholine were 23.2%－94.6% or 24.8%－92.4%, however the relaxant responses to adenosine were much weaker than those to ATP. **CONCLUSION** ATP produces contractile responses mainly *via* purine and pyrimidine(P)2 receptors and relaxant responses partially *via* P1 receptors in longitudinal muscle strips of the rat proximal colon.

Key words adenosine triphosphate adenosine receptor purinergic muscle contraction muscle relaxation colon

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通讯作者 任雷鸣 ren-leiming@263.net