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论著

内皮素-3对犬肺动静脉的作用

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摘要 阐明内皮素-3(ET-3)对肺动静脉的作用机理. 利用犬离体肺动静脉条，观察其张力改变. 结果可见：①ET-3(1～30 μmol·L^{-1})引起肺动脉舒张（低浓度）和收缩（高浓度）双向反应，ET_B受体激动剂IRL1620(1～30 μmol·L^{-1})只引起舒张反应；去内皮，ET_B受体阻断剂IRL1038(1 μmol·L^{-1})或左旋硝基精氨酸(*L*-NA，10 μmol·L^{-1})均使ET-3或IRL1620所致舒张反应减弱或消失，ET_A受体阻断剂BQ123(10 μmol·L^{-1})则使ET-3所致收缩反应翻转为舒张反应；②同浓度的ET-3和IRL1620只引起肺静脉浓度依赖性收缩反应；BQ123可使ET-3所致收缩反应减弱，IRL1038可使IRL1620所致收缩反应减弱；③在BQ123预处理条件下给予第二剂ET-3(30 μmol·L^{-1})，肺静脉表现为舒张反应，吲哚美辛(1 μmol·L^{-1})可使其舒张反应减弱. 本研究表明：①存在于肺动脉平滑肌上的ET_A受体参与血管的收缩反应，肺动脉内皮上的ET_B受体通过释放NO参与舒张反应；②肺静脉平滑肌上的ET_A和ET_B受体均参与收缩反应, 但ET_B受体所致收缩反应易脱敏；③在肺静脉平滑肌上可能还存在非ET_A/非ET_B受体，通过释放舒张性PG物质参与舒张反应.

关键词 内皮素-3 IRL1620 受体, 内皮素/拮抗剂和抑制剂 左旋硝基精氨酸 肺动脉 肺静脉 血管收缩 血管舒张

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Effects of endothelin-3 on canine isolated pulmonary arteries and veins

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Abstract

The present study was designed to determine the effects of endothelin-3(ET- 3) on canine pulmonary vasculature. The isometric tension of pulmonary arterial and venous strips were recorded. The results showed that ①ET-3(1－30 μmol·L^{-1}) elicited biphasic responses(relaxation at 1 nmol·L^{-1} and contraction at 10 nmol·L^{-1} or higher), whereas ET_B receptor agonist IRL1620(1－30 μmol·L^{-1}) induced only relaxation in dog pulmonary arteries. The relaxations by ET- 3 and IRL1620 were not affected by indomethacin, but were abolished by endothelium denudation or N^G-nitro-*L*-arginine(10 μmol·L^{-1}). The relaxations caused by ET- 3 and IRL1620 were markedly suppressed by ET B receptor antagonist IRL1038(1 μmol·L^{-1}). ET_A receptor agonist BQ123(10 μmol·L^{-1}) potentiated ET-3- induced relaxations and markedly suppresses ET-3-induced contractions. ②The same concentrations of ET-3 and IRL1620 produced only concentration- dependent contraction in pulmonary venous strips, respectively. The contractions induced by ET-3 and IRL1620 were significantly suppressed by BQ123 and IRL1038, respectively. ③Following pretreatment with ET_A receptor blocker (BQ123 10 μmol·L^{-1}), the second application of ET-3 (30 nmol·L^{-1}) produced endothelium-independent relaxation, which was abolished by indomethacin(1 μmol·L^{-1}). It is concluded that pulmonary arterial and venous responses to ET- 3 can be attributed mainly to activation of ET_A and ET_B receptors. It appears that ET_A receptors located in the vascular smooth muscle mediate contractions in the arteries and veins; ET_B receptors located in the arterial endothelium mediate relaxations via release of endothelium derived nitric oxide, whereas those located in venous smooth muscle mediate contractions. Non-ET_A/non-ET_B receptors in the venous smooth muscle are likely to participate in prostaglandin-mediated relaxation.

Key words endothelin-3 IRL1620 receptors endothelin/antagonists and inhibitors NG-nitro-L-arginine pulmonary artery pulmonary veins vasoconstriction vasodilation

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