

射干麻黄汤对慢性哮喘大鼠缺氧诱导因子-1 α 、血管内皮生长因子表达及气道重塑的影响

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作者 单位

E-mail

刘鑫 南华大学附属第一医院, 湖南 衡阳 421001

邹中兰 南华大学临床系, 湖南 衡阳 421001

梅全慧 常德市第一人民医院, 湖南 常德 415001

张恒平 南华大学临床系, 湖南 衡阳 421001

黄艳 南华大学附属第一医院, 湖南 衡阳 421001

lanlanzonglan@163.com

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中文摘要:目的: 探讨射干麻黄汤对慢性哮喘大鼠气道重塑和缺氧诱导因子-1 α (HIF-1 α)、血管内皮生长因子(VEGF)的影响。方法: 40只雄性SD大鼠按随机数字表法分成4组, 每组10只: 即哮喘模型组(A组)、射干麻黄汤低剂量组(B组)、射干麻黄汤高剂量组(C组)、正常对照组(D组)。采用卵蛋白(OVA)致敏及反复激发建立哮喘大鼠模型, 同时B, C组在每次雾化前30 min分别予以射干麻黄汤ig(分别为0.96, 3.84 g·kg⁻¹)进行干预, A, D组则同时予以等量生理盐水 ig, 共8周。采用医学图像分析软件测定支气管总壁厚(Wat/Pbm)、气管内壁厚度(Wai/Pbm)及气道平滑肌厚度(Wam/Pbm)。免疫组化检测气道壁HIF-1 α , VEGF蛋白的表达, RT-PCR观察大鼠肺组织内HIF-1 α , VEGF mRNA的表达。结果: 图像分析显示, 模型组Wat/Pbm, Wai/Pbm, Wam/Pbm分别为(68.19±4.48), (38.27±1.62), (7.61±1.33) $\mu\text{m}^2/\mu\text{m}$, 正常组分别为(34.76±1.38), (16.25±2.20), (2.89±0.45) $\mu\text{m}^2/\mu\text{m}$, 模型组与正常组比较有显著性差异($P<0.05$)。经射干麻黄汤低、高剂量治疗后与模型组比较均有显著降低, 差异有显著性($P<0.05$)。免疫组化及RT-PCR结果显示, 模型组肺组织HIF-1 α , VEGF mRNA及HIF-1 α , VEGF蛋白的表达增高, 与对照组比较, 有显著性差异($P<0.05$)。射干麻黄汤组HIF-1 α , VEGF mRNA及HIF-1 α , VEGF蛋白的表达降低, 与模型组相比, 有显著性差异($P<0.05$)。结论: 射干麻黄汤可抑制哮喘大鼠气道重塑的发生, 其机制可能与下调HIF-1 α 及VEGF的表达有关, 且其抑制哮喘气道重塑的程度与射干麻黄汤的剂量呈正相关。

中文关键词:哮喘 气道重塑 缺氧诱导因子-1 α 血管内皮生长因子 射干麻黄汤

Expression of HIF-1 α and VEGF in Airway Remodeling of Asthmatic Rats and Effect of Administration of Shigan Mahuang Tang

Abstract: Objective: To investigate the effect of hypoxia inducible factor-1 α (HIF-1 α) and vascular endothelial growth factor(VEGF) in airway remodeling of chronic asthmatic rats, to research the mechanism of Shigan Mahuang Tang in asthma treatment. Method: Forty SD rats were randomly divided into four groups: the asthma chronic model group (group A), the Shigan Mahuang Tang low dose group (group B), the Shigan Mahuang Tang high dose group (group C) and the control group (group D). The asthmatic rat model was established by sensitization and challenge with ovalbumin(OVA). And the rats in B, C group were administered the Shigan Mahuang Tang by ig (0.96, 3.84 g·kg⁻¹, respectively), and in A, D group administered the equal physiological saline in the same way for eight weeks. The airway total wall thickness(Wat/Pbm), the airway inwall thickness(Wai/Pbm), the bronchial smooth muscle thickness(Wam/Pi) were measured by using image analysis system. Immunohistochemistry and RT-PCR were used to measure the level of HIF-1 α and VEGF protein and mRNA in the rats' lung tissues. Result: Wat/Pbm, Wai/Pbm, Wam/Pbm in group A were all significantly higher than those in group D. The expression of HIF-1 α and VEGF protein and mRNA in the lung tissues of the asthma model group was higher than that in the other groups($P<0.05$). After Shigan Mahuang Tang therapy, the thickness of the airway wall, the HIF-1 α and VEGF levels in Shigan Mahuang Tang group were decreased compared to the asthma model group($P<0.05$). HIF-1 α and VEGF protein and mRNA expressions were positively correlated with airway wall thickness. Conclusion: Shigan Mahuang Tang may decline the expression of HIF-1 α , VEGF protein and mRNA and inhibition airway remodeling in asthmatic chronic rats. And its effect was positively correlated with its dosage.

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