

## 论著

### 慢性阻塞性肺疾病相关性肺动脉高压患者外周血单核细胞Rho激酶水平测定

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#### 摘要:

**目的:** 通过比较Rho关联含卷曲螺旋蛋白激酶1(Rho-associated coiled-coil containing protein kinase 1, ROCK1)在不同研究对象外周血单核细胞中的表达规律,探讨RhoA/Rho激酶信号通路在慢性阻塞性肺疾病相关性肺动脉高压中的作用。**方法:** 选取2010年12月至2011年4月在长沙市第三医院体检的健康不吸烟者10人(A组),同期同院呼吸内科住院的慢性阻塞性肺疾病不合并肺动脉高压者10人(B组),以及同期同院呼吸内科住院的慢性阻塞性肺疾病相关性肺动脉高压患者10人(C组)。分别抽取各研究对象静脉血20 mL,以percoll非连续密度梯度离心沉降法分离单个核细胞,并培养使单核细胞贴壁。刮下贴壁细胞裂解后取上清液,用ELISA法分别检测3组ROCK1水平。所有研究对象经肺功能仪检查肺功能,以彩色多普勒测定肺动脉收缩压。**结果:** 1) 3组研究对象中C组肺动脉收缩压显著高于A组与B组, (均 $P<0.01$ )。2) 3组研究对象中C组外周血单核细胞ROCK1水平高于A、B两组(均 $P<0.05$ ); B组外周血单核细胞ROCK1水平高于A组( $P<0.05$ )。3) 3组研究对象中外周血单核细胞中ROCK1水平与肺动脉收缩压呈正相关关系( $r=0.661$ ,  $P<0.05$ )。4) 3组研究对象中外周血单核细胞中ROCK1水平与肺功能FEV1%无相关关系( $r=0.131$ ,  $P>0.05$ )。**结论:** Rho激酶在肺动脉高压发病机制中具有重要意义;单核细胞中ROCK1水平可能反映慢性阻塞性肺疾病相关性肺动脉高压患者的病情严重程度。

**关键词:** 肺动脉压 慢性阻塞性肺疾病 ROCK1 单核细胞

### Measurement of Rho-kinase in peripheral blood monocytes in patients with pulmonary arterial hypertension related to chronic obstructive pulmonary diseases

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#### Abstract:

**Objective:** To determine effects of the RhoA/Rho kinase signaling pathway on patients with pulmonary arterial hypertension related to chronic obstructive pulmonary diseases by testing levels of Rho-associated coiled-coil containing protein kinase 1(ROCK1) in peripheral blood monocytes in healthy subjects, patients with chronic obstructive pulmonary diseases (COPD), and patients with pulmonary arterial hypertension related to COPD. **Methods:** Ten healthy subjects (Group A), 10 patients with COPD (Group B), and 10 patients with pulmonary arterial hypertension related to COPD (Group C) were enrolled, all of whom were hospitalized in the Third Hospital of Changsha between Dec. 2010 and Apr. 2011. Twenty-milliliters of blood was collected from each subject. The peripheral blood mononuclear cells (PBMC) were separated by Percoll<sup>®</sup> and, monocytes were incubated. Levels of ROCK1 in the three groups were measured by ELISA. The pulmonary function was measured by spirometric tests, and the pulmonary arterial systolic pressure (PASP) was detected by color Doppler echocardiogram. **Results:** 1)The PASP in Group C was significantly higher than that of Groups A and B ( $P<0.01$ ). 2) The levels of ROCK1 in monocytes of Group C were higher than those of Groups A and B ( $P<0.05$ ). The levels of ROCK1 in monocytes of Group B were higher than those of Group A ( $P<0.05$ ). 3) The levels of ROCK1 in monocytes of the three groups showed a positive correlation with PASP ( $r=0.661$ ,  $P<0.05$ ). 4) The levels of ROCK1 in monocytes of the three groups showed a negative correlation with forced expiratory volume at the first second/ forced vital capacity (FEV1%)( $r=0.131$ ,  $P>0.05$ ). **Conclusion:** Rho kinase plays a key role in the pathogenesis of pulmonary arterial hypertension. The ROCK1 may be a marker of the severity of pulmonary arterial hypertension related to COPD.

**Keywords:** pulmonary arterial pressure chronic obstructive pulmonary diseases ROCK1 monocytes

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参考文献:

1. Hatano S, Strasser T. Primary pulmonary hypertension [C]. Geneva: WHO, 2005.
2. Barst R, McGoon M, Torbicki A, et al. Diagnosis and differential assessment of pulmonary arterial hypertension [J]. J Am Coll Cardiol, 2004,43(12):S40-47.
3. Pauwels RA, Buist S, Calverley PM, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) Workshop Summary [J]. Am J Respir Crit Care Med, 2001, 163(5): 1047-1048.
4. Galiè N, Hoeper MM, Humbert M, et al. Guidelines for the diagnosis and treatment of pulmonary hypertension [J]. Eur Heart J, 2009, 30(20):2493-2537.
5. Hassoun PM, Mounthou L, Barbera JA, et al. Inflammation, growth factors, and pulmonary vascular remodeling [J]. J Am Coll Cardiol, 2009, 54(1): S10-19.
6. Morrell N, Adnot S, Archer S, et al. Cellular and molecular basis of pulmonary arterial hypertension [J]. J Am Coll Cardiol, 2009, 54(1): S20-31.
7. Doe Z, Fukumoto Y, Takaki A, et al. Evidence for Rho-kinase activation in patients with pulmonary arterial hypertension [J]. Circ J, 2009, 73(9): 1731-1739.
8. 代丽, 吴尚洁. 阿托伐他汀抑制RhoA/Rho激酶活性逆转低氧性肺动脉高压大鼠肺动脉高压和肺血管重构 [J]. 中南大学学报: 医学版, 2011, 36(1): 58-63. DAI Li, WU Shangjie. Atorvastatin attenuates hypoxic pulmonary hypertension in rats by inhibiting RhoA/Rho kinase pathway [J]. Central South University. Medical Science, 2011, 36(1): 58-63.
9. Rashid M, Tawara S, Fukumoto Y, et al. Importance of Rac1 signaling pathway inhibition in the pleiotropic effect of HMG-CoA reductase inhibitors [J]. Circ J, 2009(73): 361-370.
10. Hachulla E, Gressin V, Guillemin L, et al. Early detection of pulmonary arterial hypertension in systemic sclerosis: A French nation-wide prospective multicenter study [J]. Arthritis Rheum, 2005, 210(52): 3792-3800.
11. 孙兴珍, 田向阳. Rho激酶在肺动脉高压大鼠组织中的表达 [J]. 河北医药, 2008, 30(11): 1662-1664. SUN Xingzhen, TIAN Xiangyang. Expression of Rho kinase in lung tissues of rats with pulmonary hypertension [J]. Hebei Medical Journal, 2008, 30(11): 1662-1664.
12. Dartevelle P, Fadel E, Mussot S, et al. Chronic thromboembolic pulmonary hypertension [J]. Eur Respir J, 2004, 27(23): 637-648.
13. Reichelt A, Hoeper MM, Galanski M, et al. Chronic thromboembolic pulmonary hypertension: evaluation with 64-detector row CT versus digital subtraction angiography [J]. Eur J Radiol, 2009, 71(1): 49-54.
14. Profirovie J, Gorovoy M, Niu J, et al. A novel mechanism of G protein-dependent phosphorylation of vasodilator-stimulated phosphoprotein [J]. J Biol Chem, 2005, 280(38): 32866-32867.
15. Jaffe AB, Hall A. Rho GTPase: Biochemistry and biology [J]. Anna Rev Cell Dev Biol, 2005, 231(10): 247-269.
16. Jemigan NL, Walker BR, Resta TC. Chronic hypoxia augments protein kinase G-mediated  $Ca^{2+}$  desensitization in pulmonary vascular smooth muscle through inhibition of RhoA/Rho kinase signaling [J]. Am J Physiol Lung Cell Mol Physiol, 2004, 287(6): 1220-1229.
17. Connolly MJ, Aaronson PI. Key role of the RhoA/Rho kinase system in pulmonary hypertension [J]. Pulm Pharmacol Ther, 2011, 24(1): 1-14.

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1. 王建刚<sup>1</sup>, 梁中书<sup>1</sup>, 杨侃<sup>1</sup>, 黄志军<sup>2</sup>, 李静乐<sup>1</sup>. IL-10对急性冠脉综合征患者外周血单核细胞LOX-1表达的影响 [J]. 中南大学学报(医学版), 2008, 33(02): 169-173
2. 吴小川; 易著文; 肖建武; 何小解; . 康宁克通A对大鼠肾小球系膜细胞增生及单核细胞趋化蛋白-1表达的

作用[J]. 中南大学学报(医学版), 2003,28(1): 13-

3. 谢启应; 孙明; 杨天山仑; 周宏研;. 早期高血压主动脉单核细胞趋化因子-1的表达[J]. 中南大学学报(医学版), 2003,28(2): 145-

4. 汪雁归1, 刘昭前2, 杨天山仑3. 急性冠脉综合征患者血清MCP-1浓度和CCR2蛋白表达水平的变化[J]. 中南大学学报(医学版), 2009,34(04): 318-322

5. 邹石海 周锐 陈平 罗红 向旭东 吕友堤 诸兰艳 .

## 以肺部感染控制窗为切换点进行有创-无创序贯治疗在COPD呼吸衰竭中的应用

[1]. 中南大学学报(医学版), 2006, 31(01): 120-124

6. 瞿云中, 彭红, 陈平, 向旭东. 胸部物理治疗联合间歇无创机械通气在慢性阻塞性肺疾病呼吸衰竭患者中的应用[J]. 中南大学学报(医学版), 2009,34(07): 655-658

7. 孙永超1, 袁曙光2, 许向清2. MCP-1在IgA肾病患者肾组织中的表达[J]. 中南大学学报(医学版), 2009,34(10): 1023-1028

8. 方立1,2, 王慷慨1, 蒋磊1, 蒋碧梅1, 韦星1, 宋岚1, 邓恭华1, 肖献忠1. 膜表面核仁素对脂多糖所致TNF- $\alpha$ 和IL-1 $\beta$ 表达的影响[J]. 中南大学学报(医学版), 2008,33(11): 999-1004

9. 邹文1, 胡铁辉2. 趋化因子IL-8, MCP-1和MIP-1对非小细胞肺癌血管生成的作用和意义[J]. 中南大学学报(医学版), 2007,32(04): 665-670

10. 吴尚洁1, 邢西迁2, 甘焯1, 赵水平3, 陈平1. 阿托伐他汀对脂多糖诱导下人肺上皮细胞C反应蛋白表达的影响

[J]. 中南大学学报(医学版), 2009,34(02): 104-108

11. 吴尚洁1, \*, 赵水平2. 慢性阻塞性肺疾病患者C-反应蛋白的变化及LPS诱导下人肺泡型细胞(A549)C-反应蛋白的表达[J]. 中南大学学报(医学版), 2005,30(2): 207-210

12. 吴尚洁\*, 陈平, 蒋惜念, 刘志军. 慢性阻塞性肺疾病患者C反应蛋白水平及其与肺功能变化的相关性[J]. 中南大学学报(医学版), 2005,30(4): 444-446

13. 欧阳春, 宁建平\*, 周巧玲. 单侧输尿管梗阻大鼠肾小管间质MCP-1的表达及其意义[J]. 中南大学学报(医学版), 2004,29(5): 558-561

14. 徐运孝; 卢汉波; 张广森;. rhGM-CSF和rhG-CSF对急性白血病骨髓CFU-F形成的影响[J]. 中南大学学报(医学版), 2000,25(2): 185-

15. 陈贵华, 周向东, 胡晓, 刘益群, 李琪. 运动疗法改善慢性阻塞性肺疾病患者的生活质量和肺功能[J]. 中南大学学报(医学版), 2011,36(7): 682-686