

论著

缬沙坦对自发性高血压大鼠脑超微结构和Klotho基因表达的影响

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摘要:

目的: 探讨缬沙坦对自发性高血压模型鼠脑超微结构及其脑组织中Klotho基因和微炎症因子(ICAM-1和VCAM-1)表达的影响。方法: 选取22周龄雄性自发性高血压模型鼠10只, 随机分为高血压组与缬沙坦组(5只/组), Wistar-kyoto大鼠(WKY)5只作为正常对照组。通过电镜观察各组大鼠脑的超微结构, RT-PCR、免疫组织化学技术和Western印迹检测Klotho基因和微炎症因子(ICAM-1和VCAM-1)的表达。结果: 高血压组大鼠脑神经元的超微结构主要表现为细胞固缩、染色质边集、典型凋亡小体形成, 但经过缬沙坦干预后, 其神经元损害有所减轻。RT-PCR结果显示缬沙坦干预能够上调Klotho mRNA表达水平、下调微炎症因子ICAM-1和VCAM-1 mRNA的表达; 免疫组织化学技术和Western印迹检测证实缬沙坦干预能够增加Klotho蛋白、减少ICAM-1和VCAM-1蛋白的表达。结论: 缬沙坦能够上调Klotho的表达, 改善高血压脑超微结构的改变。

关键词: 动物模型 高血压 缬沙坦 Klotho基因

Effect of valsartan on ultrastructure in the brain tissue and expression of Klotho gene in spontaneously hypertensive rats

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Abstract:

Objective To observe the effect of valsartan on brain ultrastructure, Klotho gene and micro-inflammatory factor [intercellular adhesion molecule-1(ICAM-1) and vascular cell adhesion molecule-1(VCAM-1)] expression in spontaneously hypertensive rat models. Methods Ten male spontaneously hypertensive rats of 22 weeks age were selected and randomly divided into a hypertension group and a valsartan intervention group, while another 5 Wistar-kyoto rats were set as a normal contrast group. The brain ultrastructure of the 2 groups was observed by electron microscope. The expression of micro-inflammatory factor (ICAM-1 and VCAM-1) and Klotho gene was detected with RT-PCR, immunohistochemistry, and Western blot, respectively. Results The cerebral neuron damage of spontaneously hypertensive rats whose ultrastructure showed cell-pyknosis, chromatin margination and typical apoptotic body formation were alleviated after the intervention of valsartan. RT-PCR showed that the gene expression of Klotho increased while ICAM-1 and VCAM-1 decreased after valsartan intervention. Immunohistochemistry and Western blot also showed that the protein expression of Klotho increased, while ICAM-1 and VCAM-1 decreased after valsartan intervention. Conclusion Valsartan can improve the brain ultrastructure of spontaneously hypertensive rats by increasing the expression of Klotho.

Keywords: animal model; hypertension; valsartan; Klotho gene

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参考文献:

[1] Chobanian A V, Bakris C L, Black H R, et al. Report of the joint national committee on prevention, de-evaluation, and the treatment of high blood pressure [J]. JAMA, 2003, 289(19):2560-2578.

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- [2] 刘力生, 龚兰生. 中国高血压防治指南2005修订本 [M]. 北京: 人民卫生出版社, 2005: 10.
- LIU Lisheng, GONG Lansheng. Guidelines for Hypertension Prevention and Treatment in China: 2005 revised edition [M]. Beijing: People's Medical Publishing House, 2005: 10.
- [3] Tentolouris C, Tousoulis D, Goumas G, et al. L-Arginine in coronary atherosclerosis [J]. *Int J Cardiol*, 2000, 75 (2/3): 123-128.
- [4] Saito Y, Kurabayashi M. Klotho gene and endothelial function [J]. *Nippon Ronen Igakkai Zasshi*, 2006, 43(3): 342-344.
- [5] Chu Y, Kitayama J, Iida S, et al. Expression of anti-aging gene klotho in mouse blood vessels [J]. *FASEB J*, 2006, 20(6): A729-731.
- [6] Buemi M, Allegra A, Aloisi C, et al. Cold pressor test raises serum concentrations of ICAM-1, VCAM-1, and E-Selectin in normotensive and hypertensive patients [J]. *Hypertension*, 1997, 30(4): 845-847.
- [7] Cottone S, Mulè G, Nardi E, et al. C-reactive protein and intercellular adhesion molecule-1 are stronger predictors of oxidant stress than blood pressure in established hypertension [J]. *J Hypertens*, 2007, 25(2): 423-428.
- [8] Chamorro V, Wangensteen R, Sainz J, et al. Protective effects of the angiotensin II type 1(AT1) receptor blockade in low-renin deoxycorticosterone acetate(DOCA)-treated spontaneously hypertensive rats [J]. *Clin Sci(Lond)*, 2004, 106(3): 251-259.
- [9] Zhou Y, Zeng Z, Zhang W, et al. Lactotransferrin: a candidate tumor suppressor-Deficient expression in human nasopharyngeal carcinoma and inhibition of NPC cell proliferation by modulating the mitogen-activated protein kinase pathway [J]. *Int J Cancer*, 2008, 123(9): 2065-2072.
- [10] Fan S Q, Ma J, Zhou J, et al. Differential expression of Epstein-Barr virus-encoded RNA and several tumor-related genes in various types of nasopharyngeal epithelial lesions and nasopharyngeal carcinoma using tissue microarray analysis [J]. *Hum Pathol*, 2006, 37(5): 593-605.
- [11] Pearson T A, Mensah G A, Alexander R W, et al. Markers of inflammation and cardiovascular disease: application to clinical and public health practice: A statement for healthcare professionals from the Centers for Disease Control and Prevention and the American Heart Association [J]. *Circulation*, 2003, 107(3): 499-511.
- [12] Watson T, Goon P K, Lip G Y. Endothelial progenitor cells, endothelial dysfunction, inflammation, and oxidative stress in hypertension [J]. *Antioxid Redox Signal*, 2008, 10(6): 1079-1088.
- [13] Parisis J T, Korovesis S, Giazitzoglou E, et al. Plasma profiles of peripheral monocyte-related inflammatory markers in patients with arterial hypertension. Correlations with plasma endothelin-1 [J]. *Int J Cardiol*, 2002, 83(1): 21-23.
- [14] 谢启应, 孙明, 杨天伦. 原发性高血压患者炎症因子表达水平及其与血管紧张素 II 的关系 [J]. *临床心血管病杂志*, 2003, 19(12): 712-714.
- XIE Qiyang, SUN Ming, YANG Tianlun, et al. Plasma levels of the inflammatory markers and angiotensin-II in hypertension patients [J]. *J Clin Cardiol*, 2003, 19(12): 712-714.
- [15] 孔丽君, 江丹娜. 高血压与炎症因子关系研究进展 [J]. *现代实用医学*, 2008, 20(12): 988-991.
- KONG Lijun, JING Danna. The research progress of the relationship between hypertension and inflammatory factor [J]. *Modern Practical Medicine*, 2008, 20(12): 988-991.
- [16] 王敏, 曹秉振. 细胞间黏附因子-1与缺血性脑损伤 [J]. *国际脑血管杂志*, 2006, 14(3): 231-234.
- WANG Min, CAO Bingzhen. Inter-cell adhesion factor and ischemic brain damage [J]. *International Journal of Cerebrovascular Diseases*, 2006, 14(3): 231-234.
- [17] Ishizaka N, Mitani H, Nagai R. Angiotensin II regulates Klotho gene expression [J]. *Nippon Rinsho*, 2002, 60(10): 1935-1939.
- [18] Aizawa H, Saito Y, Nakamura T, et al. Downregulation of the Klotho gene in the kidney under sustained circulatory stress in rats [J]. *Biochem Biophys Res Commun*, 1998, 249(3): 865-871.
- [19] Guan S, Wang B. Effects of fosinopril and valsartan on expressions of ICAM-1 and NO in human umbilical vein endothelial cells [J]. *Chin Med J(Engl)*, 2003, 116(6): 923-927.
- [20] Boos C J, Anderson R A, Lip G Y. Is atrial fibrillation an inflammatory disorder? [J]. *Eur Heart J*, 2006, 27(4): 500-501.
- [21] 谢启应, 王庸晋, 孙泽琳, 等. 缬沙坦和吡嗪嗪胺对高血压病患者细胞因子影响的对比研究 [J]. *中南大学学报: 医学版*, 2006, 31(5): 629-634.
- XIE Qiyang, WANG Yongjin, SUN Zelin, et al. Effects of valsartan and indapamide on plasma cytokines in essential hypertension [J]. *J Cent South Univ. Med Sci*, 2006, 31(5): 629-634.
- [22] Prasad A, Koh K K, Schenke W H, et al. Role of angiotensin II type 1 receptor in the regulation of cellular adhesion molecules in atherosclerosis [J]. *Am Heart J*, 2001, 142(2): 248-253.
- [23] 杨丽, 代全德, 詹剑. 缬沙坦对肾性高血压大鼠脑缺血再灌注后脑组织 NF- κ Bp65及 ICAM-1表达的影响 [J]. *广东医学*, 2008, 29(6): 919-921.
- YANG Li, DAI Quande, ZHAN Jian. Influence of valsartan on the NF- κ Bp65 and ICAM-1 expression in renal hypertension rat brain tissue with cerebral ischemia and reperfusion [J]. *Guangdong Medical Journal*, 2008, 29(6): 919-921.
- [24] 周巧玲, 林书典, 彭卫生, 等. 缬沙坦对血管紧张素 II 抑制 klotho基因表达的影响 [J]. *肾脏病与透析肾移植杂志*, 2007, 16(4): 336-339.
- ZHOU Qiaoling, LIN Shudian, PENG Weisheng, et al. Effect of valsartan on angiotensin II induced down

regulation of klotho gene expression [J] . J Nephrol Dialy Transplant,2007,16(4): 336-339.

[25] Rodríguez-Iturbe B, Vaziri N D, Herrera-Acosta J, et al. Oxidative stress, renal infiltration of immune cells, and salt-sensitive hypertension: all for one and one for all [J] . Am J Physiol Renal Physiol, 2004, 286 (4) : F606-616.

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2. 刘映红; 成梅初; 朱笑萍; 刘伏友; 袁芳; .腹膜透析相关性腹膜炎兔模型的建立[J]. 中南大学学报(医学版), 2001,26(6): 573-
3. 许辉1, 刘惺2, 宁旺斌1, 陶立坚1.HIF-1 α 在5/6肾切除大鼠慢性肾纤维化模型中的表达[J]. 中南大学学报(医学版), 2009,34(04): 308-312
4. 何晓雷1, 刘玉丽2, 张岩2, 张荣利2, 杨碧波1.清醒犬慢性充血性心力衰竭模型的血流动力学特征[J]. 中南大学学报(医学版), 2009,34(06): 487-491
5. 吕红斌1, 杨颖2, 曾驰1, 周家辉1, 胡建中1, 徐大启1, 李康华1, 秦岭3.低强度脉冲超声对新生骨成熟过程的影响[J]. 中南大学学报(医学版), 2009,34(10): 984-990
6. 王学红, 汪春莲, 卢放根, 孟钰, 刘小伟.乳酸杆菌CL22菌株治疗Balb/c小鼠Hp感染性胃炎模型的有效性研究[J]. 中南大学学报(医学版), 2007,32(02): 341-346
7. 颜津津, 王瑞, 王玉忠, 周文斌.慢性EAE模型C57BL/6J小鼠脑和脊髓EBI3和p28 mRNA表达[J]. 中南大学学报(医学版), 2008,33(11): 1028-1036
8. 颜津津, 黄国祥, 肖波,杨欢, 吴志国, 周文斌.一种慢性EAE模型的制备方法[J]. 中南大学学报(医学版), 2008,33(08): 663-668
9. 肖志明, 沈守荣, 连平, 王晓艳, 刘芬.裸鼠脾脏移植瘤模型在NGX6抗结肠癌转移作用研究中的应用[J]. 中南大学学报(医学版), 2007,32(05): 753-757
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11. 卓莉1,2, 刘伏友1,2,* , 彭佑铭1,2, 刘映红1,2, 刘虹1,2, 周凌辉1,2, 许向青1,2,蒋洁茵1,2.不同腹膜纤维化大鼠模型之比较[J]. 中南大学学报(医学版), 2005,30(2): 162-166
12. 卢艳1, 王海琴2, 王新3.高同型半胱氨酸血症孕鼠与其仔鼠发生先天性心脏病的关系[J]. 中南大学学报(医学版), 2011,36(1): 68-
13. 张新民; 刘映红; 梁青春; .腹膜透析相关性腹膜炎兔模型的病理形态学观察[J]. 中南大学学报(医学版), 2001,26(3): 203-

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