

[1]朱晋坤,毛华,尹扬光,等.重组血管紧张素(1-7)基因转染对大鼠急性心肌梗死后细胞外基质重构的影响[J].第三军医大学学报,2014,36(13):1380-1385.

Zhu Jinkun,Mao Hua,Yin Yangguang,et al.Effects of Ang-(1-7) gene transfection on ventricular remodeling in myocardial infarction rats[J].J Third Mil Med Univ,2014,36(13):1380-1385.

点击复制

## 重组血管紧张素(1-7)基因转染对大鼠急性心肌梗死

重构的影响  
分享到:



### 导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

### 工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(2287KB\)](#)

[立即打印本文/Print Now](#)

[查看/发表评论/Comments](#)

[导出](#)

### 统计/STATISTICS

[摘要浏览/Viewed](#)

[全文下载/Downloads](#) 184

[评论/Comments](#) 96

### 评论/COMMENT



[登陆留言](#) [点击查看](#)



更新日期/Last Update: 2014-07-02

《第三军医大学学报》[ISSN:1000-5404/CN:51-1095/R] 卷: 36 期数: 2014年第13期 页码: 1380-1385 栏目: 论著 出版日期: 2014-07-15

Title: Effects of Ang-(1-7) gene transfection on ventricular remodeling in myocardial infarction rats

作者: 朱晋坤; 毛华; 尹扬光; 董文; 邓梦扬; 鲁玉明; 熊宗华; 杜峰; 文美; 刘廷筑  
贵阳市第一人民医院心血管内科; 第三军医大学新桥医院急诊科

Author(s): Zhu Jinkun; Mao Hua; Yin Yangguang; Dong Wen; Deng Mengyang; Lu Yuming; Xiong Zonghua; Du Feng; Wen Mei; Liu Yanzhu  
Department of Cardiovasology, First People's Hospital of Guiyang City, Guiyang, Guizhou Province, 550002; Department of Emergency, Xinqiao Hospital, Third Military Medical University, Chongqing, 400037, China

关键词: 心肌梗死; 心室重构; 血管紧张素1-7; 基质金属蛋白酶

Keywords: myocardial infarction; ventricular remodeling; angiotensin 1-7; matrix metalloproteinase

分类号: R329.24; R394.3; R542.22

文献标志码: A

摘要: 目的 观察重组血管紧张素(1-7) [angiotensin 1-7, Ang(1-7)]对大鼠急性心肌梗死(acute myocardial infarction, AMI)后细胞外基质重构的影响,并探讨其可能的分子机制。 方法 40只成年雄性SD大鼠按随机数字表法分为4组:假手术组(SHAM)、心肌梗死组(MI)、报告基因组(MI+EGFP)和Ang(1-7)组[MI+Ang(1-7)],每组10只。采用冠状动脉结扎法建立大鼠AMI模型,MI+EGFP与MI+Ang(1-7)两组于心肌梗死周边区各选取5个点心肌内注射EGFP和Ang(1-7),SHAM组和MI组不予注射。术后4周测量心室质量/体质量、血流动力学;组织学方法评价心肌组织结构变化与胶原沉积;免疫组化检测Ang(1-7),I、III型胶原水平变化及蛋白印迹法检测MMP-2及TIMP-2的变化。 结果 ①MI+Ang(1-7)组Ang(1-7)高效稳定表达,显著高于其余各组。②与SHAM组相比,MI与MI+EGFP两组心室质量/体质量,左室舒张末压,梗死周边区Ang(1-7),MMP-2,TIMP-2,I、III型胶原表达量及I/III型胶原比例均增加,而左室内压最大上升速率(dp/dtmax)和下降速率(dp/dtmin)显著下降(P<0.05)。③与MI及MI+EGFP

组相比, MI+Ang(1-7)组Ang(1-7)、TIMP-2表达量及dp/dtmax、dp/dtmin明显增加, MMP-2, I、III型胶原表达量及I/III型胶原比例显著降低( $P<0.05$ )。 结论 Ang(1-7)显著改善大鼠急性心肌梗死后细胞外基质重构, 其机制可能与通过上调TIMP-2, 下调MMP-2蛋白表达相关。

**Abstract:** **Objective** To determine the effects of adenoviral gene transfer of angiotensin converting 1-7 (Ang-(1-7)) on the ventricular remodeling in rats with acute myocardial infarction (AMI) and investigate the possible protective mechanisms. **Methods** A total of 40 male Sprague-Dawley rats were randomly divided into 4 groups (n=10 for each group), that is, sham operation group, MI group, AMI+EGFP group and MI+Ang-(1-7) group. AMI model were induced by ligation of the left anterior descending coronary artery. Rats in the MI+EGFP and MI+Ang(1-7) groups received an intra-myocardial injection of EGFP and Ang-(1-7), respectively. Rats in the MI and sham operation groups received no injection intervention. In 4 weeks later, heart weight/body weight (HW/BW), left ventricular end diastolic pressure (LVEDP), dp/dtmax and dp/dtmin were examined. Myocardial structure changes and collagen deposition were evaluated histopathologically. The expression of Ang-(1-7), MMP-2, TIMP-2, collagen type I and collagen type III were measured by Western blotting and immunohistochemical staining. **Results** The protein expression of Ang-(1-7) was significantly higher in myocardial tissue in MI+Ang-(1-7) group than the other groups. Compared with the sham operation group, the expression levels of Ang-(1-7), MMP-2, TIMP-2, collagen type I and III in the tissue around the infarct, and the ratio of collagen type I to III were increased, the ratio of ventricular/body weight and LVEDP were significantly higher, and dp/dtmax and dp/dtmin were significantly decreased in MI and MI+EGFP groups. MI+Ang-(1-7) group had significantly increased expression of Ang-(1-7) and TIMP-2, obviously elevated dp/dtmax and dp/dtmin, and markedly decreased MMP-2, collagen type I and III the ratio of collagen type I to III when compared with MI and MI+EGFP group. **Conclusion** Ang-(1-7) significantly improves extracellular matrix remodeling after myocardial infarction, which may be related to up-regulation of TIMP-2 and down-regulation of MMP-2.

#### 参考文献/References:

朱晋坤, 毛华, 尹扬光, 等. 重组血管紧张素(1-7)基因转染对大鼠急性心肌梗死后细胞外基质重构的影响[J]. 第三军医大学学报, 2014, 36(13): 1380-1385.

#### 相似文献/References:

[1] 赵然尊, 龙仙萍, 刘志江, 等. 转染hRAMP1的间充质干细胞对心肌梗死后局部血管再生的作用[J]. 第三军医大学学报, 2012, 34(15): 1496.

Zhao Ranzun, Long Xianping, Liu Zhijiang, et al. MSCs with hRAMP1 overexpression improve revascularization in a rabbit model of myocardial infarction[J]. J Third Mil Med Univ, 2012, 34(13): 1496.

[2] 任宁, 周欣, 李贺, 等. 巨噬细胞移植对大鼠心肌梗死后细胞外基质修复的影响[J]. 第三军医大学学报, 2012, 34(17): 1727.

Ren Ning, Zhou Xin, Li He, et al. Effect of macrophage transplantation on extracellular matrix repair after myocardial infarction in rats[J]. J Third Mil Med Univ, 2012, 34(13): 1727.

[3] 何国祥, 蒋清安, 刘建平, 等. 低压稳恒直流电场促进兔梗死-缺血心肌血管新生的效应[J]. 第三军医大学学报, 2008, 30(05): 402.

HE Guo-xiang, JIANG Qing-an, LIU Jian-ping, et al. Efficacy of weak steady direct current electrical fields in chronic myocardial infarction rabbits[J]. J Third Mil Med Univ, 2008, 30(13): 402.

[4] 蒋清安, 何国祥, 刘建平, 等. 一种新的非人工通气兔心肌梗死模型的制作[J]. 第三军医大学学报, 2008, 30(05): 406.

JIANG Qing-an, HE Guo-xiang, LIU Jian-ping, et al. A novel rabbit model of myocardial infarction without endotracheal intubation[J]. J Third Mil Med Univ, 2008, 30(13): 406.

[5] 肖骏, 余强, 罗开良, 等. 别嘌呤醇对心肌梗死后大鼠心肌细胞凋亡的抑制作用[J]. 第三军医大学学报, 2008, 30(08): 735.

- XIAO Jun,SHE Qiang,LUO Kai liang,et al.Allopurinol inhibits cardiomyocyte apoptosis in rats with myocardial infarction[J].J Third Mil Med Univ,2008,30(13):735.
- [6]陈章荣,罗开良,殷跃辉,等.蛋白酶抑制剂MG-132改善大鼠心肌梗死后心肌结构重塑[J].第三军医大学学报,2008,30(08):750.  
CHEN Zhang-rong,LUO Kai-liang,YIN Yue-hui,et al.Proteasome inhibitor MG 132 improves left ventricular remodeling after myocardial infarction in rats[J].J Third Mil Med Univ,2008,30(13):750.
- [7]向平,宋银子,陈沅,等.提高大鼠心肌梗死模型成功率及存活率的研究[J].第三军医大学学报,2008,30(04):329.  
XIANG Ping,SONG Yin-zi,CHEN Yuan,et al.Methods on enhancing success rate and survival rate of rat model of myocardial infarction[J].J Third Mil Med Univ,2008,30(13):329.
- [8]王红勇,何作云,于长青,等.自体骨骼肌卫星细胞移植对心肌梗死大鼠心功能的影响[J].第三军医大学学报,2006,28(24):2444.
- [9]牟杨,张灿晶,李刚.ATM-Akt蛋白在梗死灶周围心肌的表达及苯肾上腺素对其的干预效应[J].第三军医大学学报,2010,32(08):790.  
Mu Yang,Zhang Canjing,Li Gang.Changes of ATM-Akt signaling in myocardium around infarcted zones and its intervention by phenylephrine in rats[J].J Third Mil Med Univ,2010,32(13):790.
- [10]徐云云,肖践明,张瑞云,等.碱性成纤维细胞生长因子及其受体在心肌梗死心脏组织中的分布[J].第三军医大学学报,2010,32(14):1542.  
Xu Yunyun,Xiao Jianming,Zhang Ruiyun,et al.Distribution of basic fibroblast growth factor and its receptor in minipig heart after myocardial infarction[J].J Third Mil Med Univ,2010,32(13):1542.
- [11]袁小媚,马康华.IGF-1、PKC在大鼠心肌梗死后左室重构中的表达及意义[J].第三军医大学学报,2006,28(12):1305.
- [12]常广磊,刘剑,张冬颖,等.辛伐他汀对心肌梗死大鼠心室重构与FoxO3a表达的影响[J].第三军医大学学报,2011,33(03):266.  
Chang Guanglei,Liu Jian,Zhang Dongying,et al.Effect of simvastatin on FoxO3a expression and ventricular remodeling in rats with myocardial infarction[J].J Third Mil Med Univ,2011,33(13):266.
- [13]吕瑾,刘增长,张全军,等.ACE2过表达对大鼠心肌梗死后心室重构的影响[J].第三军医大学学报,2013,35(16):1680.  
Lyu Jin,Liu Zengzhang,Zhang Quanjun,et al.Effect of overexpression of angiotensin converting enzyme 2 on ventricular remodeling after myocardial infarction in rats[J].J Third Mil Med Univ,2013,35(13):1680.