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论著

银杏叶提取物延迟预处理对大鼠心肌缺血再灌注时细胞色素c氧化酶表达的影响

冉珂[1], 万晶晶[2], 杨东林[1], 肖艳英[1], 常业恬[1]

1. 中南大学湘雅二医院麻醉科, 长沙 410011;
2. 中南大学湘雅三医院手术室, 长沙 410013

摘要:

目的:探讨银杏叶提取物(EGb761)延迟预处理对大鼠心肌缺血再灌注时细胞色素c氧化酶(cytochrome c oxidase,CcO)表达的影响。**方法**:健康成年Sprague-Dawley雄性大鼠40只,随机分成4组:S组(假手术组),仅开胸并分离冠状动脉左前降支,但不阻断血流150 min;IR组(缺血再灌注组),行冠状动脉左前降支阻断30 min,再灌注120 min; M组(银杏叶提取物延迟预处理组),予以静脉注射银杏叶提取物EGb761 100 mg/kg,给药后24 h同IR组处理;D组[银杏叶提取物预处理+5-羟葵酸(5-HD)组],缺血前15 min静脉注射5-HD 5 mg/kg,余同M组处理。再灌注结束后测心肌CcO的表达和心肌梗死面积,观察心肌细胞超微结构。**结果**:与IR组[(37.87±5.92)%]比较,M组[(23.78±4.82)%]心肌梗死面积减小(P<0.05),D组[(39.62±5.18)%]差异无统计学意义(P>0.05)。与S组比,IR组、M组和D组CcO均升高(P<0.05);与IR组比,M组CcO增高(P<0.05)。电镜下,M组心肌细胞损伤程度较IR组减轻,D组与IR组差异无统计学意义(P>0.05)。**结论**:银杏叶提取物延迟预处理对大鼠心肌的保护作用与上调心肌CcO表达有关。

关键词: 银杏叶提取物 延迟预处理 心肌 细胞色素C氧化酶

Effect of *Gingkgo biloba* leaf extract induced delayed preconditioning on cytochrome c oxidase expression during myocardial ischemia-reperfusion in rats

RAN Ke[1], WAN Jingjing[2], YANG Donglin[1], XIAO Yanying[1], CHANG Yetian[1]

1. Department of Anesthesiology, Second Xiangya Hospital, Central South University, Changsha 410011;
2. Department of Operation Room, Third Xiangya Hospital, Central South University, Changsha 410013, China

Abstract:

Objective: To determine the effect of *Gingkgo biloba* leaf extract (EGb761) induced delayed preconditioning on cytochrome c oxidase (CcO) expression during myocardial ischemia-reperfusion in rats. Methods: Four groups (10 in each) of Sprague-Dawley male rats were studied. In the sham group, the rats received no treatment. Rats in the ischemia-reperfusion (IR) group were treated with NS (1.0 mL/kg intravenously) 24 h before ischemia. Rats in the M group were treated with EGb761 (100 mg/kg intravenously) 24 h before the ischemia. In the D group, EGb761-treated rats that received the 5-hydroxydecanoate (5-HD), an inhibitor of mitochondrial KATP channels 15 min before the ischemia. The IR, M, and D groups were subjected to ischemia by 30 min of coronary artery occlusion before 2 h of reperfusion. At the end of the reperfusion, myocardial infarct size was measured. CcO was measured by Western blot. The myocardial ultrastructure was observed under the electron microscope. Results: The infarct size was significantly smaller in the M group [(23.78±4.82)%] than in the I/R group [(37.87±5.92)%] (P<0.05). The CcO protein expression in the myocardium was significantly higher in the M group than in the I/R group(P<0.05). Microscopic examination showed less myocardial damage in the M group than that in the I/R group. The infarct size, CcO protein expression, and myocardial damage had no significant difference between the D group and the I/R group (P>0.05). Conclusion: EGb761 induced delayed preconditioning attenuates myocardial ischemia-reperfusion injury possibly through up-regulating CcO expression in rats.

Keywords: *Gingkgo biloba* leaf extract delayed preconditioning myocardium cytochrome c oxidase

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通讯作者: 万晶晶,Email:wanjj77@163.com

作者简介: 冉珂,博士,主治医师,主要从事围术期心肌保护研究。
作者Email: wanjj77@163.com

参考文献：

[1] 李年生,钟志莲,姜德建. 银杏叶提取物的心肌延迟保护作用及其机制研究［J］.中草药, 2007,38(7):1046-1050. LI Niansheng, ZHONG Zhilian, JIANG Dejian. Delayed cardioprotection of Gingkgo biloba leaf extract and its mechanisms［J］.Chinese Traditional and Herbal Drugs,2007, 38(7):1046-1050.

[2] Shen J, Wang J, Zhao B, et al. Effects of EGb761 on nitricoxide and oxygen free radical,myocardial damage and arrhythm ia in ischemic-reperfusion injury in vivo［J］. Biochim Blophys Acta,1998,1406(3):228-236.

[3] Yu Q, Nguyen T, Ogbi M, et al.Differential loss of cytochrome-c oxidase subunits in ischemia-reperfusion injury: exacerbation of COI subunit loss by PKC-epsilon inhibition［J］. Am J Physiol Heart Circ Physiol,2008,294(6):H2637-2645.

[4] Guo D, Nguyen T, Ogbi M, et al.Protein kinase C-epsilon coimmunoprecipitates with cytochrome oxidase subunit IV and is associated with improved cytochrome-c oxidase activity and cardioprotection［J］. Am J Physiol Heart Circ Physiol,2007, 293(4):H2219-2230.

[5] 冉珂,段开明,邹定全,等.异氟醚预处理延迟相对兔心肌缺血再灌注损伤的保护作用［J］.中南大学学报:医学版,2008,33(2):146-150. Ran Ke,DUAN Kaiming, ZOU Dingquan, et al.Effects of isoflurane delayed preconditioning on myocardial ischemia reperfusion injury in rabbits［J］.Journal of Central South University. Medical Science,2008,33(2):146-150.

[6] Xiao YY, Chang YT, Ran K, et al. Delayed preconditioning by sevoflurane elicits changes in the mitochondrial proteome in ischemia-reperfused rat hearts［J］. Anesth Analg,2011,113(2):224-232.

[7] 张燕,郑利民,田玉科. 血液稀释和川芎嗪对兔缺血-再灌注损伤及超微结构的影响［J］.临床麻醉学杂志,2009,25(6):514-516. ZHANG Yan, ZHENG Limin, TIAN Yuke.Effects of hemodilution and ligustrazine oil myocardial enzyms and ultrastructure in ischemia-reperfusion injury in rabbits［J］. Journal of Clinical Anesthesiology,2009,25(6):514-516.

[8] Rohilla A, Singh G, Singh M, et al. Possible involvement of PKC-delta in the abrogated cardioprotective potential of ischemic preconditioning in hyperhomocysteinemic rat hearts［J］.Biomed Pharmacother,2010,64(3):195-202.

[9] Ferrera R, Benhabbouche S, Bopassa JC, et al. One hour reperfusion is enough to assess function and infarct size with TTC staining in Langendorff rat model［J］.Cardiovasc Drugs Ther,2009,23(4):327-331.

[10] Li Y, Cai M, Xu Y, et al.Late phase ischemic preconditioning preserves mitochondrial oxygen metabolism and attenuates post-ischemic myocardial tissue hyperoxygenation［J］. Life Sci,2011,88(1/2):57-64.

[11] 郭健,刘义,李延平,等. 银杏叶总提取物H_2O_2诱发的心肌细胞损伤的保护作用［J］.中草药,2008,39(12):1864-1867. GUO Jian, LIU Yi, LI Yanping, et al. Gingkgo biloba leaf extract pretreatment protects cardiomyocytes against injury induced by hydrogen peroxide［J］.Chinese Traditional and Herbal Drugs,2008,39(12):1864-1867.

本刊中的类似文章

1．冉珂1，段开明2 ，邹定全1，李志坚1，金丽艳1，常业恬1.异氟醚预处理延迟相对兔心肌缺血再灌注损伤的保护作用[J]. 中南大学学报(医学版), 2008,33(02): 146-150
2．徐军美； 胡冬煦； 常业恬； 倪斌； 邹永华；.缺血预处理抑制缺血再灌注所致兔在体心肌细胞凋亡[J]. 中南大学学报(医学版), 2001,26(6): 505-
3．梁日初； 许雍皓；.急性心肌梗死患者血清C反应蛋白与CK-MB相关性研究[J]. 中南大学学报(医学版), 2001,26(6): 559-
4．陈享； 文小丹； 曾珊； 文建亚； 谭鹏； 詹樾； 周新民； 胡建国； 江亚平； .人参皂甙对开心术心肌保护作用的超微形态计量学研究[J]. 中南大学学报(医学版), 2002,27(5): 419-
5．唐英； 王泉云；.七氟醚和缺氧预适应诱导乳鼠心肌细胞HSP70表达的改变[J]. 中南大学学报(医学版), 2003,28(2): 129-
6．徐军美； 谭嵘； 胡冬煦； 常业恬； 曹丽君； .缺血预处理对兔缺血再灌注心肌bcl-2,bax,p53基因表达的

影响[J]. 中南大学学报(医学版), 2003,28(2): 111-
7. 杨天嵩； 李传昶； 蒲晓群； 郑昭芬； 荆施展； 邓金华； 孟霜媛；.急性心肌梗塞的经皮腔内冠状动脉成形术治疗[J]. 中南大学学报(医学版), 2003,28(2): 152-
8. 罗学滨， 刘可， 易宝欣， 王浩， 刘梅冬， 肖献忠， 邓恭华， 热休克蛋白72在氧化应激所致急性乳鼠培养心肌细胞损伤中的作用[J]. 中南大学学报(医学版), 2006,31(02): 228-231
9. 刘琴， 黄昌林， 贺民， 张丽娜， 蔡宏伟， 郭曲练.围术期美托洛尔对老年非心脏手术病人血流动力学及心肌缺血的影响[J]. 中南大学学报(医学版), 2006,31(02): 249-253
10. 王越晖， 蔡露， 糖尿病/肥胖相关的炎症，心肌细胞死亡及心肌病[J]. 中南大学学报(医学版), 2006,31(06): 814-818
11. 郑昭芬， 蒲晓群， 杨天<IMG height=16 alt=, 地尔硫<IMG height=17 alt=┼┼. 中南大学学报(医学版), 2006,31(06): 917-920
12. 谢才姣， 冉珂， 刘建华， 徐军美， 常业恬.金属硫蛋白介导腺苷A1受体激动剂延迟预处理对兔心肌的保护作用[J]. 中南大学学报(医学版), 2009,34(07): 603-607
13. 秦晓同1， 贾春文1， 潘闽1， 沈爱国2， 景宏美1.阿托伐他汀对压力负荷心肌肥厚大鼠血管紧张素转换酶2表达的干预研究[J]. 中南大学学报(医学版), 2008,33(05): 438-442
14. 陈淳媛，孙跃女，杨作成，蔡姿丽，杨敏.雷帕霉素对柯萨奇病毒B3诱导的大鼠心肌细胞mTOR和eIF-4E表达的调控作用[J]. 中南大学学报(医学版), 2008,33(07): 612-617
15. 徐向辉， 常业恬， 李李， 李晶， 张冬梅， 邹小华.1,6-二磷酸果糖在肺手术围术期的心肌保护作用[J]. 中南大学学报(医学版), 2008,33(10): 966-969
