中国药理学与毒理学杂志 2008 22 (5): 341-347 ISSN: 1000-3002 CN: 11-1115/R

论著

L-芝麻素对代谢综合征大鼠心肌损伤的抑制作用

黄 凯, 杨解人*, 周 勇

（皖南医学院药理学教研室, 安徽 芜湖 241001）

收稿日期 2007-11-9 修回日期 网络版发布日期 2008-9-25 接受日期 2008-6-13

摘要 目的 探讨*L*-芝麻素对代谢综合征大鼠心肌损伤是否有抑制作用。方法 大鼠分正常组、模型组、*L*-芝麻素(30，60和120 mg·kg^{-1})和辛伐他汀(5 mg·kg^{-1})治疗组，除正常组给予正常饲料外，其余各组给予高脂高糖饲料诱导大鼠代谢综合征。至第9周时，各给药组给予含不同浓度L-芝麻素或辛伐他汀的高脂高糖饲料，每天1次。连续16周后，称体重（BW）、全心湿重（HWW）和左心室湿重（LVWW）；取心肌组织测定心肌羟脯氨酸(HYP)、过氧化氢（H_2O_2）和一氧化氮（NO）含量，及超氧化物歧化酶(SOD)和过氧化氢酶(CAT)活性；HE染色观察心肌组织病理变化；免疫组化法检测心肌诱导型一氧化氮合酶（iNOS）表达和硝基酪氨酸(NT) 含量。结果 与正常组比较，模型组BW, HWW和LVWW明显增加，心肌H_2O_2，HYP和NO含量明显升高，SOD和CAT活性明显降低，iNOS表达和NT含量增多，并出现心肌纤维增粗肥大且排列紊乱、组织中大量炎症细胞和脂肪组织浸润等严重的病理性改变。与模型组比较，*L*-芝麻素60和120 mg·kg^{-1}组及辛伐他汀组BW〔(328±11)，(313±10)和(310±10) *vs* (411±14)g〕，HWW〔(0.94±0.07)，(0.86±0.11)和(0.85±0.12) *vs* (1.21±0.19)g〕和LVWW〔(0.77±0.08)，(0.65±0.09)和(0.67±0.06) *vs* (1.03±0.22)g〕降低，心肌H_2O_2〔（239±50），(201±35)和（182±39） *vs* （302±41）mmol·L^{-1}〕，HYP〔（1.09±0.09），（0.95±0.06）和（0.88±0.09） *vs* (1.21±0.07)mg·g^{-1}蛋白〕和NO含量〔(1.51±0.46)，(0.98±0.26)和(0.76±0.37) *vs* (2.61±0.41)μmol·L^{-1}〕明显下降，SOD〔(71±12)，(84±10)和(90±10) *vs* (49±8)μmol·min^{-1}·L^{-1}〕和CAT活性〔（27±8），(34±6)和（36±9） *vs* (20±4)μmol·L^{-1}〕显著升高；心肌iNOS表达和NT含量减少，病理损伤明显减轻。结论 *L*-芝麻素可抑制代谢综合征大鼠心肌损伤，该作用可能与其抑制氧化应激和提高抗氧化能力有关。

关键词 L-芝麻素 代谢综合征 心肌 氧化性应激

分类号 R963

Inhibitory effect of *L*-sesamin on myocardial damage of metabolic syndrome rats

HUANG Kai, YANG Jie-Ren*, ZHOU Yong

(Department of Pharmacology, Wannan Medical College, Wuhu 241001, China)

Abstract

AIM To investigate whether *L*-sesamin has inhibitory effect on myocardium of metabolic syndrome rats. **METHODS** Metabolic syndrome rat model was induced by using high-fat and refined-carbohydrate diet for 24 weeks. *L*-Sesamin (30，60 and 120 mg·kg^{-1}) and simvastatin (5 mg·kg^{-1}) were given to the metabolic syndrome rats with daily diet on 9th week, which lasted for 16 weeks. The rat body weight (BW), heart wet weight (HWW) and left ventricle wet weight (LVWW) were recorded. The content of hydroxyproline (HYP), hydrogen dioxide (H_2O_2) and nitric oxide (NO), and the activities of superoxide dismutase (SOD) and catalase(CAT) in myocardium were measured. The pathological changes of myocardium were observed with HE staining. To explore the possible mechanism, the expression of inducible nitric oxide synthase(iNOS) and content of nitrotyrosine (NT) of myocardium were detected with immunohistochemical method. **RESULTS** Compared with normal group, the BW, HWW and LVWW in model group obviously elevated, and the content of H_2O_2, HYP and NO in myocardium markedly increased, while the activities of SOD and CAT in myocardium significantly reduced. The expression of iNOS and content of NT in myocardium obviously increased. The cardiac muscle cells markedly proliferated and hypertrophied, and generous leucocyte and fat tissue were deposited among cardiac muscles. In *L*-sesamin 60 and 120 mg·kg^{-1} and simvastatin 5 mg·kg^{-1} groups, the BW 〔(328±11), (313±10) and (310±10) *vs* (411±14)g〕, HWW〔(0.94±0.07)，(0.86±0.11) and (0.85±0.12) *vs* (1.21±0.19)g〕 and LVWW〔（0.77±0.08），(0.65±0.09) and (0.67±0.06) *vs* (1.03±0.22)g〕 obviously decreased compared with that in model group. The contents of H_2O_2〔（239±50）,(201±35) and （182±39） *vs* （302±41)mmol·L^{-1}〕, HYP〔(1.09±0.09), (0.95±0.06） and （0.88±0.09） *vs* (1.21±0.07)mg·g^{-1} protein〕 and NO 〔(1.51±0.46), (0.98±0.26) and （0.76±0.37） *vs* (2.61±0.41) μmol·L^{-1}〕 in myocardium markedly reduced, too. The activities of SOD 〔（71±12）, (84±10) and (90±10) *vs* (49±8)

μmol·min^{-1}·L^{-1}〕 and CAT 〔（27±8）, (34±6) and（36±9） *vs* (20±4)μmol·min^{-1}·L^{-1}〕 in myocardium obviously increased, while the expression of iNOS and content of NT decreased. In addition, the pathological changes among cardiac muscles were markedly improved. **CONCLUSION** *L*-Sesamin may inhibit myocardium injuries of metabolic syndrome rats, which may be related with its inhibition of oxidative stress and reinforce antioxidative abilities.

Key words L-sesamin metabolic syndrome myocardium oxidative stress

DOI: 10.3867/j.issn.1000-3002.2008.05.004

通讯作者 杨解人 wnmcyaoli@sina.com