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论著

D-硝基精氨酸对小鼠肾损伤及氧化应激作用

韩 滨，张丽丽，由振强，辛艳飞，陈云祥，陈国灿，徐潘生，陈 颖，宣尧仙

（浙江省医学科学院安全性评价研究中心，浙江 杭州 310013）

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摘要 **目的** 研究*D*-硝基精氨酸（*D*-NNA）对小鼠的肾损伤及其氧化应激机制。**方法** ICR小鼠ig给予*D*-NNA 150，50和15 mg·kg^{-1}，连续30 d。测定并计算肾系数；血液生化分析仪检测血清中肌酐（Crea）和尿素氮（BUN）；分光光度法测定肾组织一氧化氮（NO），硫代巴比妥酸法测丙二醛（MDA）含量，比色法测定谷胱甘肽过氧化酶（GSH-Px）和超氧化物歧化酶（SOD）活性；观察肾病理组织学变化。**结果** 与5%葡萄糖对照组相比，*D*-NNA 150，50和15 mg·kg^{-1}组血清中BUN分别明显升高了83.6%，36.2%和27.4%（*P*<0.05），*D*-NNA 150和50 mg·kg^{-1}组血清中Crea分别明显升高了281.6%和10.6%（*P*<0.05）；*D*-NNA 150 mg·kg^{-1} 组肾系数和NO水平分别明显降低了5.6%和25.5%（*P*<0.05）；*D*-NNA 150和50 mg·kg^{-1}组肾组织中MDA水平分别明显升高了69.0%和36.9%（*P*<0.01），SOD活性和GSH-Px活性分别明显下降了17.4%和17.7%，7.3%和13.7%（*P*<0.05）；*D*-NNA 150 mg·kg^{-1}组病理检查可见肾小管损伤，嗜碱性变，萎缩或囊性扩张和间质炎性浸润，*D*-NNA 50和15 mg·kg^{-1} 组出现炎症细胞浸润。**结论** *D*-NNA对小鼠肾有一定的损伤作用，其作用机制可能与*D*-NNA的手性转化产物*L*-NNA导致NO合成减少，产生ROS有关。

关键词 D-硝基精氨酸 肾损伤 一氧化氮 氧化应激

分类号 R963

Renal toxicity and oxidative stress mechanism of N^{G}-nitro-*D*-arginine on the kidney of mice

HAN Bin, ZHANG Li-li, YOU Zhen-qiang, XIN Yan-fei, CHEN Yun-xiang, CHEN Guo-can, XU Pan-sheng, CHEN Ying, XUAN Yao-xian

(National Key Laboratory of Safety Evaluation for New Drugs, Zhejiang Academy of Medical Sciences, Hangzhou 310013, China)

Abstract

OBJECTIVE To explore the renal toxicity of N^{G}-nitro-*D*-arginine(*D*-NNA) and oxidative stress mechanism. **METHODS** After *D*-NNA 150, 50 and 15 mg·kg^{-1} was ip given for 30 d, the kidney index, blood urea nitrogen (BUN) and creatinine(Crea) were assessed. The nitric oxide (NO) concentration, malondialdehyde(MDA) content, glutathione peroxidase (GSH-Px) and superoxide dismutase (SOD) activities in the renal cortex were determined and histopathological changes in renal tissues were detected. **RESULTS**]Compared with 5% glucose control group, BUN in *D*-NNA 150, 50 and 15 mg·kg^{-1} groups increased by 83.6%, 36.2% and 27.4%（*P*<0.05）, respectively; Crea in *D*-NNA 150 and 50 mg·kg^{-1} groups increased by 281.6% and 10.6%（*P*<0.05）; the kidney index and NO concentration decreased significantly to 5.6% and 25.5% in *D*-NNA 150 mg·kg^{-1} group; the MDA content increased significantly to 69.0% and 36.9%（*P* <0.01） while SOD and GSH-Px activities decreased significantly to 17.4% and 17.7%（*P*<0.01）， 7.3% and 13.7% (*P*<0.05) in *D*-NNA 150 and 50 mg·kg^{-1} groups. Histopathology of mice showed renal tubular injury, basophilic change, atrophy, cystic expansion mild interstitial inflammatory infiltration in *D*-NNA 150 mg·kg^{-1} group, but interstitial inflammatory infiltration in *D*-NNA 50 and 15 mg·kg^{-1} groups. **CONCLUSION** *D*-NNA can induce renal toxicity, the mechanism of which may be due to the decreasing of NO content and increase of ROS induced by *L*-NNA which is a chiral inversion product of *D*-NNA.

Key words NG-nitro-D-arginine renal damage nitric oxide oxidative stress

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通讯作者 宣尧仙 nndsvc@mail.hz.zj.cn