中国公共卫生 2013, 29(5) 710-713 DOI: 10.11847/zgggws2013-29-05-29 ISSN: 1001-0580 CN: 21-1234/R

论文

镉对MCF-7细胞生长和雌激素受体表达影响

徐孝娜[1], 李娅[2], 季爱玲[1], 刘寒强[1], 张磊[1], 邱雅[1], 侯祥红[1], 王枫[1]

1. 第四军医大学营养与食品卫生学教研室,陕西 西安 710032;
2. 第四军医大学航空航天卫生与卫生勤务学教研室

摘要:

目的 观察镉对MCF-7人乳腺癌细胞生长和雌激素受体表达的影响。方法 四甲基偶氮噻唑蓝(MTT)法筛选镉促进MCF-7细胞增殖的最佳作用时间和剂量,用流式细胞术观察细胞死亡情况,划痕实验评价细胞迁移能力,western-blot检测雌激素受体α、雌激素受体β蛋白表达,同时加入雌激素受体阻断剂氟维司群观察细胞增殖和2种雌激素受体表达的变化情况。结果 1 μmol/L镉处理24 h和1 nmol/L镉处理72 h对MCF-7细胞的促增殖效应最明显,增殖率(PR)分别为133%、138%;1 nmol/L镉处理72 h能明显抑制MCF-7细胞死亡,死亡细胞比例为28.5%,低于对照组的44.5%(t=4.557,P<0.05);增强细胞迁移能力,划痕伤口愈合率为25.7%,与对照组比较差异有统计学意义(t=5.696,P<0.05);增加雌激素受体α蛋白的表达;雌激素受体阻断剂能够抑制镉对MCF-7细胞的促增殖作用和拮抗镉对雌激素受体α蛋白表达增加的效应。结论 长时间低剂量处理镉对MCF-7乳腺癌细胞生长有促进作用并可能与激活雌激素受体α表达有关。

关键词: 镉 乳腺癌细胞 雌激素受体

Effects of cadmium on growth of MCF-7 cells and estrogen receptor expression

XU Xiao-na, LI Ya, JI Ai-ling, et al

Department of Nutrition and Food Hygiene,The Fourth Military Medical University,Xi'an,Shaanxi Province 710032,China

Abstract:

Objective To investigate the effects of cadmium on the growth of MCF-7 breast cancer cells and estrogen receptor expression.Methods Methyl thiazolyl tetrazolium(MTT) assay was used to estimate the best time and dose of cadmium to promote the proliferation of MCF-7 cells.The death of cells was measured via flow cytometry.The ability of cell migration was evaluated with wound healing assay.The protein expression of estrogen receptor was detected by western blot.The changes of cell proliferation and estrogen receptors expression while estrogen receptors were blocked by estrogen receptor antagonist were observed.Results The effect of cadmium exposure on MCF-7 cell proliferation promotion was most significant for the cadmium treatment of 1 μmol/L for 24 hours and 1 nmol/L for 72 hours,with the proliferation rate of 133.0% and 138.0%.Cadmium exposure of 1 nmol/L for 72 hours could significantly inhibit the death of MCF-7 cells,with a lower proportion of dead cell(28.5%) compared to that of the control group(44.5%)(t=4.557,P<0.05);the cell migration ability was enhanced;the scratch wound healing rate was 25.7%,with a significant difference compared with that of the control group;the estrogen receptor α protein expression was increased.The estrogen receptor antagonist could suppress the effect of cadmium treatment on proliferation of MCF-7 cells and antagonize the increase of estrogen receptor α protein expression.Conclusion Long-time low-dose cadmium treatment can promote the proliferation of MCF-7 breast cancer cells and the effect maybe relate to the activation of estrogen receptor α.

Keywords: cadmium breast cancer cell estrogen receptor

收稿日期 2012-12-11 修回日期 网络版发布日期

DOI: 10.11847/zgggws2013-29-05-29

基金项目:

通讯作者: 王枫

作者简介:

参考文献：

[1] Byrne C,Divekar SD,Storchan GB,et al.Cadmium-a metallohormone?[J].Toxicol Appl Pharmacol,2009,238:266-271.
[2] Akesson A,Julin B,Wolk A.Long-term dietary cadmium intake and postmenopausal endometrial cancer incidence:a population-based prospective cohort study[J].Cancer Res,2008,68:6435-6441.
[3] Satarug S,Garrett SH,Sens MA,et al.Cadmium,environmental exposure,and health outcomes [J].Environ Health Perspect,2010,118:182-190.
[4] 刘安平,彭良斌,吴瑞肖,等.环境镉污染健康损害分级判定标准研究[J].中国公共卫生,2011,27(6):791-792.
[5] Slebos RJ,Li M,Evjen AN,et al.Mutagenic effect of cadmium on tetranucleotide repeats in human cells [J].Mutat Res,2006,602(1-2):92-99.
[6] Zang Y,Odwin-DaCosta S,Yager JD.Effects of cadmium on estrogen receptor mediated signaling and estrogen induced DNA synthesis in T47D human breast cancer cells[J].Toxicol Lett,2009,184(2):134-138.
[7] Aimola P,Carmignani M,Volpe AR,et al.Cadmium induces p53-dependent apoptosis in human prostate epithelial cells[J].Plos One,2012,7(3):e33647.
[8] 刘瑾,吴停停,沈晓华,等.低剂量接触镉对未成年大鼠卵巢发育影响[J].中国公共卫生,2012,28(9):1218-1219.

本刊中的类似文章

1．吴小胜, 魏帅, 杨鸣琦, 魏益民, 郭波莉.亚慢性镉暴露致五指山猪肾脏脂质过氧化损伤[J]. 中国公共卫生, 2013,29(1): 79-81
2．刘海柏, 周志衡, 雷毅雄.镉对16HBE细胞凋亡及Bal-2、Bax基因表达影响[J]. 中国公共卫生, 2013,29(3): 366-368
3．董丽娜, 王敏, 雷毅雄.正常细胞与镉转化细胞抑制消减cDNA文库构建[J]. 中国公共卫生, 2013,29(4): 512-514
4．孙亮, 赵亮, 张丽君, 石聪明, 朱绪文, 王克跃.赫章县土法炼锌致镉污染现状调查[J]. 中国公共卫生, 2013,29(4): 541-543

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

反馈人		邮箱地址	
反馈标题		验证码	7815