

论著

梓醇对乳胞素诱导SH-SY5Y细胞损伤的保护作用

刘云, 包琼琼, 庄晓赛, 胡乔, 孙妙璇, 周莉莉, 张雄

(温州医学院附属第二医院神经内科, 浙江 温州 325027)

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摘要 **目的** 探讨梓醇对蛋白酶体抑制剂乳胞素诱导的人神经母细胞瘤 (SH-SY5Y) 细胞损伤的保护作用及其可能机制。**方法** 梓醇 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 预处理SH-SY5Y细胞1 h后, 加入乳胞素 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 继续处理24 h。倒置显微镜下观察细胞形态的变化, MTT比色法检测细胞存活率, 流式细胞仪检测细胞凋亡率, Hoechst33258染色观察细胞核形态的变化, 酶联免疫吸附检测细胞内20S蛋白酶体含量。**结果** 与正常对照组相比, 梓醇 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 对细胞存活率、形态和凋亡及20S蛋白酶体含量无显著差异; 乳胞素 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 组细胞存活率为 $(72.0\pm 1.8)\%$, 明显降低 ($P<0.05$), 细胞凋亡率为 $(64.7\pm 2.6)\%$, 明显增高 ($P<0.05$)。Hoechst33258染色发现梓醇细胞核形态改变, 出现凋亡小体; 细胞内20S蛋白酶体含量降低60%, 差异具有统计学意义 ($P<0.05$)。与乳胞素 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 组相比, 梓醇 $10\ \mu\text{mol}\cdot\text{L}^{-1}$ 预处理组细胞存活率 $(87.9\pm 2.2)\%$ 明显增高 ($P<0.05$), 细胞凋亡率为 $(51.4\pm 1.5)\%$, 明显降低 ($P<0.05$)。Hoechst33258染色发现, 梓醇细胞核形态明显改善; 细胞内20S蛋白酶体含量升高了1.9倍, 差异具有统计学意义 ($P<0.05$)。**结论** 梓醇对乳胞素诱导的SH-SY5Y细胞损伤具有保护作用, 其机制可能与梓醇提高SH-SY5Y细胞内20S蛋白酶体含量有关。

关键词 梓醇 SH-SY5Y细胞 细胞凋亡 蛋白酶体 神经保护

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Protective effect of catalpol on lactacystin-induced injury in SH-SY5Y cells

LIU Yun, BAO Qiong-qiong, ZHUANG Xiao-sai, HU Qiao, SUN Miao-xuan, ZHOU Li-li, ZHANG Xiong

(Department of Neurology, the Second Affiliated Hospital, Wenzhou Medical College, Wenzhou 325027, China)

Abstract

OBJECTIVE To investigate the protective effect of catalpol on lactacystin-induced injury in human neuroblastoma (SH-SY5Y) cells and to explore the potential mechanism. **METHODS** SH-SY5Y cells were pretreated with catalpol $10\ \mu\text{mol}\cdot\text{L}^{-1}$ for 1 h and then exposed to lactacystin $10\ \mu\text{mol}\cdot\text{L}^{-1}$ for 24 h. The cell morphous were observed under an inverted microscopy. Cell viability was detected by MTT assay. Cell nucleus changes were assessed by Hoechst33258 staining. The cell apoptosis rate was measured by flow cytometry using Annexin-V and propidium iodide (PI). The human 20S proteasome content was detected by enzyme-linked immunosorbent assay. **RESULTS** Compared with normal control group, catalpol $10\ \mu\text{mol}\cdot\text{L}^{-1}$ had no significant effect on cell survival, cell morphology, cell apoptosis, or the content of 20S proteasome. But in lactacystin $10\ \mu\text{mol}\cdot\text{L}^{-1}$ group, cell survival significantly decreased to $(72.0\pm 1.8)\%$ while the apoptosis rate increased to $(64.7\pm 2.6)\%$ ($P<0.05$). The cell morphology in lactacystin $10\ \mu\text{mol}\cdot\text{L}^{-1}$ group was changed and even apoptotic bodies were observed. The content of 20S proteasome decreased 2.5 fold ($P<0.05$). Compared with lactacystin $10\ \mu\text{mol}\cdot\text{L}^{-1}$ group, the survival rate increased to $(87.9\pm 2.2)\%$ and apoptosis rate decreased to $(51.4\pm 1.5)\%$ in catalpol $10\ \mu\text{mol}\cdot\text{L}^{-1}$ group ($P<0.05$). Hoechst33258 staining showed the improvement in cell nucleus, and the content of 20S proteasome increased by 2.9 fold ($P<0.05$). **CONCLUSION** Catalpol has protective effect against lactacystin-induced injury in SH-SY5Y cells, and the mechanism may be associated with the increase of the content of 20S proteasome in cells.

Key words catalpol SH-SY5Y apoptosis proteasome neuroprotection

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通讯作者 张雄 zhangxiong98@gmail.com

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