中国药理学与毒理学杂志 2010 24 (2): 106-110 ISSN: 1000-3002 CN: 11-1115/R

论著

穿心莲内酯对人肺腺癌A549细胞NF-κB通路的调控作用

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收稿日期 2009-7-1 修回日期 网络版发布日期 2010-3-26 接受日期 2009-12-25

摘要 目的 探讨穿心莲内酯对肿瘤细胞生长的作用及机制。方法 人肺腺癌A549细胞分别与穿心莲内酯1.5～30 μmol·L^{-1}作用24 h，以及穿心莲内酯30 μmol·L^{-1}作用4～24 h。用MTT法检测A549细胞存活率；Western印迹法检测在肿瘤坏死因子α(TNF-α)10 μg·L^{-1}刺激下，穿心莲内酯30 μmol·L^{-1}对 NF-κB信号通路中的相关蛋白NF-κB抑制因子α（IκBα）、磷酸化IκBα、IκB激酶β（IKKβ）和磷酸化IKKβ表达的影响；ELISA法检测穿心莲内酯对A549细胞核内NF-κB DNA结合活性的影响。结果 穿心莲内酯的浓度和作用时间与A549细胞的存活率密切相关，穿心莲内酯30 μmol·L^{-1}作用24 h，A549细胞的存活率下降到(22.0±1.2)%，而穿心莲内酯1.5 μmol·L^{-1}作用24 h或者穿心莲内酯30 μmol·L^{-1}作用4 h对A549细胞的存活率几乎无影响。Western印迹法显示，穿心莲内酯能够抑制TNF-α诱导的NF-κB信号通路中IKKβ的磷酸化，抑制IκBα的磷酸化，推迟IκBα的降解，对IKKβ的表达无影响。穿心莲内酯还能够抑制TNF-α诱导的A549细胞核内NF-κB p65蛋白的DNA结合活性，抑制率达32%。结论 穿心莲内酯通过影响NF-κB信号通路抑制A549细胞的生长。

关键词 穿心莲内酯 A549细胞株 NF-κB

分类号 R963

Effects of andrographolide on NF-κB signaling pathway in human lung adenocarcinoma A549 cells

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Abstract

OBJECTIVE To investigate the effect of andrographolide (Andro) on the nuclear factor-kappa B (NF-κB) signaling pathway in human lung adenocarcinoma cell line A549 and possible mechanisms. **METHODS** A549 cells were treated with Andro 1.5，3，6，15 and 30 μmol·L^{-1} for 24 h, or with Andro 30 μmol·L^{-1} for 4, 8, 12 and 24 h. MTT method was used to detect cell survival. In addition, A549 cells were divided into 2 groups: control group, in which cells were only stimulated with TNF-α 10 μg·L^{-1} for 0, 5, 15, and 30 min; Andro group, in which cells were pre-incubated with Andro 30 μmol·L^{-1} for 4 h before 30 minutes of stimulation of TNF-α 10 μg·L^{-1}, to study the expression of NF-κB signaling proteins, including inhibitor of κB α (IκBα), phosphorylated IκBα, IκB kinase β(IKKβ) and phosphorylated IKKβ by Western blotting and NF-κB DNA binding activity by ELISA. **RESULTS** The concentration and duration of both Andro treatment were related to the survival rate of A549 cells that declined to (22.0±1.2)% after 24 h incubation with Andro 30 μmol·L^{-1}. In addition, the treatment of Andro 1.5 μmol·L^{-1} for 24 h or Andro 30 μmol·L^{-1} for 4 h had no effect on the survival rate of A549 cells. Furthermore, Andro inhibited TNF-α-induced phosphorylation of IKKβ in A549 cells, reduced phosphorylation of IκBα, blocked the subsequent degradation of IκBα, and had no effect on the expression of IKKβ. Andro decreased the DNA binding activity of NF-κB p65 in the nucleus of A549 cells and the inhibitory rate was 32%. **CONCLUSION** Andro can inhibit the growth of A549 cells by blocking NF-κB signaling pathway.

Key words andrographolide A549 cell line NF-κB

DOI: 10.3867/j.issn.1000-3002.2010.02.005

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