中国药理学与毒理学杂志 2011 25 (3): 264-268 ISSN: 1000-3002 CN: 11-1115/R

论著

槲皮素对热应激后神经胶质瘤细胞凋亡及热激蛋白表达的影响

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收稿日期 2010-6-21 **修回日期** **网络版发布日期** 2011-5-31 **接受日期** 2010-12-20

摘要 **目的** 探讨槲皮素对神经胶质瘤细胞(C6细胞)凋亡的影响及作用机制。**方法** C6细胞加入槲皮素0～200 μmol·L^{-1}培养1 h后，于42℃水浴加热1 h，再正常培养12 h。MTT法检测C6细胞存活率，Hoechst/PI双染法，annexinⅤ-FITC/PI双染检测细胞凋亡率，Western印迹法检测热激蛋白70(HSP70)表达。**结果** 与正常对照组相比，加热组细胞存活率和细胞凋亡率均无明显改变，但加热组HSP70表达水平从正常对照组的0.22±0.01升高到0.36±0.02（P<0.01）。槲皮素能明显抑制C6细胞增殖，槲皮素50，100，150和200 μmol·L^{-1}细胞存活率分别为103%，86%，77%和75%，呈浓度依赖性（r=0.94，P<0.05）。槲皮素50，100和200 μmol·L^{-1}显著诱导C6细胞凋亡(P<0.05)。与加热组相比，随着槲皮素浓度的增加，C6细胞早期和晚期凋亡率均明显增加，最高细胞凋亡率为59%，槲皮素200 μmol·L^{-1}处理后明显降低了加热导致的HSP70表达增加，降低了53%（P<0.01）。**结论** 槲皮素可以抑制HSP70表达并诱导神经胶质瘤细胞凋亡。

关键词 槲皮素 热激蛋白70 神经胶质瘤 细胞凋亡

分类号 R966

Effect of quercetin on heat induced glioma cell apoptosis and expression of heat shock protein

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Abstract

OBJECTIVE To investigate the effect of quercetin on glioma cell apoptosis and the mechanisms thereof. **METHODS** The glioma C6 cells were treated with quercetin 0-200 μmol·L^{-1} for 1 h before they were heated in a 42℃ water bath for 1 h, followed by culturing at 37℃ in a humidified atmosphere of 5% CO_2 for 12 h. The cell viability was assessed by MTT assay. Apoptosis was assessed by annexinⅤ-FITC and PI staining followed by analysis with flow cytometry. Expression of heat shock protein 70 (HSP70) was assessed by Western blot analysis. **RESULTS** There was no difference in cell viability and cell apoptosis between control group and heat-shock group. But the HSP70 expression increased from 0.22±0.01 in normal control group to 0.36±0.02 in heat-shock group（P<0.01）. The viability of cells was significantly decreased by quercetin 50，100，150 and 200 μmol·L^{-1}, and respectively was 103%, 86%, 77% and 75%, showing a concentration- dependent manner (r=0.94, P<0.05). Quercetin 50, 100 and 200 μmol·L^{-1} significantly induced C6 cells apoptosis (P<0.05). Compared with heat-shock group, the rate of apoptosis, early or late was significantly enhanced with the increase in the concentrations of quercetin, while the highest apoptosis rate in C6 cells was 59%. HSP70 expression was decreased by 53% with quercetin 200 μmol·L^{-1} treatment in comparison with heat-treat group (P<0.01). **CONCLUSION** Quercetin shows the ability to suppress the expression of HSP70 impelled brain glioma cell apoptosis.

Key words quercetin heat shock protein 70 glioma apoptosis

DOI: 10.3867/j.issn.1000-3002.2011.03.009

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