

辛伐他汀诱导K562 细胞凋亡过程中Caspase-3 、Caspase-9 活性变化

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Changes of Caspase-3 and Caspase-9 Activity during the Simvastatin-induced Apoptosis in K562 Cells

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摘要

目的 观察辛伐他汀诱导K562细胞凋亡过程中Caspase-3、Caspase-9活性的变化。方法 不同浓度辛伐他汀处理K562细胞,用细胞形态学、流式细胞技术检测细胞凋亡,比色法测定Caspase-3、Caspase-9活性。结果 5、10、20 $\mu\text{mol/L}$ 辛伐他汀作用K562细胞48h后出现核固缩、核碎裂和凋亡小体等形态学改变,其凋亡率分别为(4.00 \pm 0.13)%、(6.24 \pm 0.18)%、(9.41 \pm 0.22)%,与对照组比较差异具有统计学意义($P < 0.01$)。作用72h后细胞凋亡率分别为(7.62 \pm 0.21)%、(12.41 \pm 0.32)%、(19.08 \pm 0.26)%,与对照组比较差异具有统计学意义($P < 0.01$)。同时Caspase-3、Caspase-9活性明显升高,10 $\mu\text{mol/L}$ 与20 $\mu\text{mol/L}$ 组Caspase-3、Caspase-9活性与对照组比较差异具有统计学意义($P < 0.01$)。结论 辛伐他汀可能通过活化Caspase-9,并进而活化Caspase-3诱导K562细胞凋亡。

关键词: 辛伐他汀 Caspase 细胞凋亡

Abstract: Objective To observe the variations of Caspase-3 and Caspase-9 activities in the process of simvastatin-induced apoptosis in K562 cells. Methods K562 cells were exposed to different concentrations of simvastatin, cell morphological analysis and flow cytometry were performed to confirm cell apoptosis. Colorimetric method was used to measure Caspase-3 and Caspase-9 activities. Results K562 cells could be induced to undergo apoptosis after 5, 10, 20 $\mu\text{mol/L}$ simvastatin treatment for 48h, and the apoptotic rate was (4.00 \pm 0.13)%, (6.24 \pm 0.18)% and (9.41 \pm 0.22)% respectively, compared with the control group, it was significantly higher ($P < 0.01$). At 72h, K562 cells were apoptotic with a rate of (7.62 \pm 0.21)%, (12.41 \pm 0.32)% and (19.08 \pm 0.26)% respectively, compared with the control group, it was markedly higher ($P < 0.01$). Furthermore, Caspase-3 and Caspase-9 activity in K562 cells elevated remarkably after 10, 20 $\mu\text{mol/L}$ simvastatin treatment for 48h and 72h, compared with the control group, it was markedly higher ($P < 0.01$). Conclusion K562 cells can be induced to undergo apoptosis by simvastatin, the underlying mechanism might be related to upregulation of Caspase-9 activity which subsequently transforms Caspase-3 into its active form.

Key words: Simvastatin Caspase Apoptosis

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