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上调Twist基因对人结肠癌SW480细胞增殖 凋亡及侵袭能力的影响

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Effects of the Upregulated Twist Gene Expression on the Proliferation, Apoptosis, and Invasive Capability of Human Colon Cancer SW480 cells

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摘要 上调人结肠癌SW480细胞株中Twist基因的表达, 观察其对细胞增殖、凋亡及侵袭能力的影响。方法: 将高表达Twist基因的质粒和空载质粒稳定转染SW480细胞, 分别命名为转染组和对照组, MTT法、细胞划痕实验和Matrigel侵袭实验分别检测肿瘤细胞体外增殖、迁移及侵袭能力的变化。FCM检测细胞周期及凋亡情况。将肿瘤细胞接种至裸鼠皮下, 对比转染前后肿瘤细胞的成瘤情况。结果: 从第4天开始, 转染组SW480细胞生长速度明显高于对照组 ($P < 0.05$); 转染组SW480细胞的增殖指数 (PI) 和S期细胞比例 [$(61.279 \pm 1.709)\%$, $(33.171 \pm 3.154)\%$] 均高于对照组 [$(26.142 \pm 1.518)\%$, $(14.112 \pm 2.137)\%$] ($P < 0.05$); 转染组的细胞凋亡率 ($6.831 \pm 1.624\%$) 低于对照组 ($12.223 \pm 1.733\%$) ($P < 0.05$); 划痕24 h及48 h时后转染组细胞迁移率 [$(40.06 \pm 5.56)\%$, $(75.77 \pm 8.06)\%$] 均高于对照组 [$(25.25 \pm 2.65)\%$, $(35.37 \pm 6.79)\%$] ($P < 0.05$); Matrigel侵袭实验结果显示转染组侵袭细胞个数明显高于对照组 ($P < 0.05$); 将两组细胞分别接种裸鼠, 16 d左右可见肿瘤结节, 转染组肿瘤体积及瘤重均大于对照组 ($P < 0.05$)。结论: 上调Twist基因可提高SW480细胞体外增殖、迁移和侵袭能力, 降低SW480细胞凋亡率。

关键词: 结肠癌细胞 Twist基因 增殖 侵袭 凋亡

Abstract: To evaluate the effects of the Twist gene on cell proliferation, apoptosis, and invasive capability of colon cancer SW480 cells. Methods: SE480 cells were transfected with highly expressed Twist plasmid. MTT was used to monitor cell proliferation, wound-healing assay to observe cell motility rate, Matrigel invasion assay to observe cell invasiveness, and flow cytometry (FCM) to observe the effect of the Twist gene on the cell cycle and apoptosis. The cells were injected into nude mice, and the tumor forming condition was observed. Results: The growth rate of the stably transfected group was significantly higher than that in the control group since day 4 ($P < 0.05$). The proliferation index (PI) of the transfected group was $61.279\% \pm 1.709\%$, and the percentage of cells in S stage was $33.171\% \pm 3.154\%$, significantly higher than those in the control group ($26.142\% \pm 1.518\%$, $14.112\% \pm 2.137\%$, $P < 0.05$). Cells in the transfected group rapidly migrated and closed the wound by $40.06\% \pm 5.56\%$ and $75.77\% \pm 8.06\%$ at 24 and 48 h, respectively, significantly higher than the control group ($25.24\% \pm 2.65\%$, $35.37\% \pm 6.79\%$). The apoptosis rate of the SW480 cells in the transfected group ($6.831\% \pm 1.624\%$) was significantly lower than that of the control group ($12.223\% \pm 1.733\%$) ($P < 0.05$). The tumor was observed at 16 days after injecting the transfected cells into nude mice. The tumor volume in the transfected group was significantly larger than that in the control cells control group ($P < 0.05$). The tumor was significantly heavier in the transfected group than that in the control group ($P < 0.05$). Conclusion: The upregulated expression of Twist gene can increase the proliferation, migration, and invasion capability of SW480 cells and lower the apoptosis rate of the SW480 cells.

Key words: Colon cancer cell Twist gene Proliferation Invasion Apoptosis

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