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热疗联合人肿瘤坏死因子对TNFR1高表达胶质瘤的细胞周期、F-肌动蛋白及其侵袭性的影响

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Effect of Hyperthermia Combined with rhTNF on Cell Cycle,F-actin and Invasiveness to Over-expressed TNFR1 Glioma Cells

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摘要

目的

探讨热疗联合重组人肿瘤坏死因子（recombinant human tumor necrosis factor，rhTNF）对肿瘤坏死因子受体1 (tumor necrosis factor receptor 1,TNFR1)高表达的胶质瘤细胞的细胞周期和F-肌动蛋白(F-actin)的影响及其与胶质瘤侵袭性的关系。

方法

建立TNFR1高表达胶质瘤细胞株，RT-PCR和Western blot法检测胶质瘤细胞TNFR1的表达水平；碘化丙啶染色后用流式细胞术检测胶质瘤细胞细胞周期的变化；WST-8法检测细胞增殖；免疫荧光技术检测胶质瘤细胞内F-actin的表达水平；Transwell小室法检测胶质瘤细胞侵袭性改变。

结果

与对照组相比，TNFR1高表达胶质瘤细胞株的TNFR1 mRNA水平增加了78.5%，其蛋白质的表达水平增加了89.7% ($P<0.05$)；经热疗联合rhTNF处理后细胞增殖受抑制，S和G_2/M期的TNFR1高表达胶质瘤细胞数之和明显增多，而F-actin的荧光强度和胶质瘤侵袭性分别降低了72.3% 和83.10%。

结论

热疗联合rhTNF可能是通过阻滞TNFR1高表达胶质瘤细胞的细胞周期和降低F-actin的表达来实现降低胶质瘤侵袭性的作用。

关键词： 热疗 肿瘤坏死因子受体1 F-肌动蛋白 胶质瘤 肿瘤侵袭性

Abstract:

Objective

The study objective was to investigate the effect of hyperthermia combined with rhTNF on cell cycle and F-actin of TNFR1 in over-expressed glioma, as well as invasiveness in vitro.

Methods

C6 cell Line of over-expressed TNFR1 (C6/TNFR1) was constructed., The mRNA and protein of TNFR1 were measured by reverse transcription-polymerase chain reaction (RT-PCR) and Western blot respectively, and the cell cycle and cell proliferation were determined by flow cytometry(stained by propidium iodide) and WST-8 respectively. The invasiveness was measured by transwell assay and immunofluorescence technique was used to measure F-actin protein expression.

Results

Compared with the control group,the mRNA and protein levels of TNFR1 in c6/TNFR1 cell was increased, by

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78.5% and 89.7% (P<0.05), respectively.The cell proliferation was inhibited and most of c6/TNFR1 cells were arrested in S+G_2/M phase compared with the control group cells after hyperthermia combined with rhTNF treatment (P<0.05). The fluorescence intensity of F-actin and the average number of C6/TNFR1 cells passing through the inserted filter were decreased by 72.3% and 83.10% respectively, compared to the control group cells after hyperthermia combined with rhTNF treatment (P<0.01).

Conclusion

Hyperthermia combined with rhTNF might reduce glioma of C6/TNFR1 invasiveness through blocking cell cycle and reducing the expression of F-action.

Key words: Hyperthermia Tumor necrosis factor receptor 1 (TNFR1) F-actin Glioma Tumor invasiveness

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