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论著

TRAIL和顺铂对横纹肌肉瘤细胞凋亡时caspase-3活性和线粒体膜电位的影响

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摘要

目的: 探讨肿瘤坏死因子相关诱导凋亡配体（TRAIL）蛋白和顺铂协同抑制横纹肌肉瘤细胞生长和诱导凋亡作用及其机制。方法: 将不同浓度的TRAIL和顺铂作用于培养的人RD胚胎型横纹肌肉瘤细胞，通过MTT比色法、形态学改变、流式细胞仪检测细胞凋亡、caspase-3活性和线粒体膜电位的改变，分析其对横纹肌肉瘤细胞的作用及和顺铂协同作用的效果和机制。结果: TRAIL浓度为1.0、10.0、100.0 μg/L时，细胞毒性指数分别为18.9%、20.8%、43.5%；顺铂浓度为1.0、5.0、10.0 mg/L时，细胞毒性指数分别为9.8%、23.4%和43.8%。而浓度为100 μg/L的TRAIL与浓度为5 mg/L的顺铂联合作用时，细胞毒性指数明显高达66.4%，FCM分析显示联合应用后细胞线粒体跨膜电位降低，同时提高caspase-3的活性,与细胞凋亡率增加相一致。结论: TRAIL和顺铂联合应用对横纹肌肉瘤细胞具有明显的协同杀伤效果，这一作用与增加caspase-3活性及降低线粒体跨膜电位有关。

关键词 横纹肌肉瘤； 肿瘤坏死因子相关诱导凋亡配体；顺铂；半胱氨酸天冬氨酸蛋白酶3
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Mitochondrial membrane potential and caspase-3 are involved in apoptosis of RD cells induced by TRAIL and cisplatin

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Abstract

<P><FONT face=Verdana>AIM: To study the synergistic induction of apoptosis by TRAIL and cisplatin in rhabdomyosarcoma </FONT><FONT face=Verdana>cells and investigate the role of mitochondrial membrane potential and caspase-3 in this </FONT><FONT face=Verdana>process.
METHODS: Rhabdomyosarcoma cells were treated with TRAIL, cisplatin for 3 days, respectively </FONT><FONT face=Verdana>or combination. The cytotoxicity was observed by MTT assay. The apoptotic rates and change </FONT><FONT face=Verdana>of mitochondrial membrane potential and caspase-3 were determined by flow cytometry (FCM). </FONT><FONT face=Verdana>The obvious morphological changes in rhabdomyosarcoma cells were confirmed by electron </FONT><FONT face=Verdana>microscope.
RESULTS: Rhabdomyosarcome cells were treated with TRAIL (1.0, 10.0

and 100.0 μg/L), the </FONT><FONT face=Verdana>cytotoxicity indices were 18.9%, 20.8% and 43.5%, respectively. With cisplatin (1.0, 5.0 </FONT><FONT face=Verdana>and 10.0 mg/L), the indices of cytotoxicity were 9.8%, 23.4% and 43.8%, respectively. When </FONT><FONT face=Verdana>TRAIL and cisplatin treatment used simultaneously, the cytotoxicity index increased </FONT><FONT face=Verdana>obviously. The activity of caspase-3 in rhabdomyosarcoma cells was upregulated and the </FONT><FONT face=Verdana>mitochondrial membrane potential was downregulated with cisplatin, which were paralleled by </FONT><FONT face=Verdana>the apoptotic rates. The obvious apotosis morphological changes in rhabdomyosarcoma cells </FONT><FONT face=Verdana>were shown by electron microscope.
CONCLUSION: TRAIL and cisplatin are able to kill rhabdomyosarcoma cells. TRAIL in </FONT><FONT face=Verdana>combination with cisplatin shows synergistic effect on rhabdomyosarcoma cells by increasing </FONT><FONT face=Verdana>the caspase-3 activity and suppressing mitochondrial membrane potential. </FONT></P>

Key words Rhabdomyosarcoma TNF-related apoptosis-inducing ligand Cisplatin Caspase-3

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