

论著

地塞米松和淀粉样 β 蛋白片段25-35对PC12细胞损伤和凋亡的影响

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摘要

目的 探讨地塞米松 (DEX) 和淀粉样 β 蛋白片段25-35 ($A\beta_{25-35}$) 联合作用对PC12细胞损伤和凋亡的影响。**方法** 采用单独或联合应用DEX 0.1~10 $\mu\text{mol}\cdot\text{L}^{-1}$ 和 $A\beta_{25-35}$ 1~5 $\mu\text{mol}\cdot\text{L}^{-1}$ 作用PC12细胞24 h, MTT法测定细胞活力; 膜联蛋白-V, PI双染流式细胞仪检测细胞凋亡率, PI单染流式细胞仪检测细胞凋亡峰; 逆转录-PCR检测胱天蛋白酶3 mRNA的表达水平。**结果** MTT结果显示, 与正常对照组相比, DEX 5和10 $\mu\text{mol}\cdot\text{L}^{-1}$, $A\beta_{25-35}$ 1, 5和10 $\mu\text{mol}\cdot\text{L}^{-1}$, DEX 5+ $A\beta_{25-35}$ 1, 5和10 $\mu\text{mol}\cdot\text{L}^{-1}$ 及DEX 10+ $A\beta_{25-35}$ 5, 10 $\mu\text{mol}\cdot\text{L}^{-1}$ 组均可明显降低PC12细胞存活率, 而DEX联合 $A\beta_{25-35}$ 能明显减少PC12细胞数 ($P<0.01$)。流式细胞仪结果显示, DEX 5 $\mu\text{mol}\cdot\text{L}^{-1}$ 和 $A\beta_{25-35}$ 1 $\mu\text{mol}\cdot\text{L}^{-1}$ 单独作用对PC12细胞凋亡率和亚二倍体凋亡峰有一定的增加作用 ($P<0.05$), 两者联合作用能明显增加PC12细胞早期和中晚期凋亡率, 增加亚二倍体凋亡峰 ($P<0.01$); RT-PCR结果显示, DEX 5 $\mu\text{mol}\cdot\text{L}^{-1}$ 和 $A\beta_{25-35}$ 1 $\mu\text{mol}\cdot\text{L}^{-1}$ 单独作用对PC12细胞胱天蛋白酶3 mRNA的表达水平没有明显影响, 它们联合作用能明显增加PC12细胞胱天蛋白酶3 mRNA的表达水平 ($P<0.05$)。**结论** DEX和 $A\beta_{25-35}$ 联合作用能明显增加对PC12细胞的损伤, 促进胱天蛋白酶3 mRNA表达, 诱导PC12细胞凋亡。

关键词 [地塞米松](#) [淀粉样 \$\beta\$ 蛋白](#) [阿尔茨海默病](#) [细胞凋亡](#)

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Effect of dexamethasone and amyloid beta protein fragment 25-35 on PC12 cells injury and apoptosis

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Abstract

OBJECTIVE To study the effect of dexamethasone (DEX) and amyloid beta protein fragment 25-35 ($A\beta_{25-35}$) on PC12 cells injury and apoptosis. **METHODS** DEX 0.1-10 $\mu\text{mol}\cdot\text{L}^{-1}$ and $A\beta_{25-35}$ 1-5 $\mu\text{mol}\cdot\text{L}^{-1}$ were administered alone or in combination to PC12 cells. PC12 cells survival was detected by MTT assay. PC12 cells apoptosis was detected by flow cytometer with Annexin-V/PI double stain and PI single stain. Caspase 3 mRNA level in PC12 cells was detected by RT-PCR. **RESULTS** MTT results showed that, DEX 5, 10 $\mu\text{mol}\cdot\text{L}^{-1}$, $A\beta_{25-35}$ 1, 5, 10 $\mu\text{mol}\cdot\text{L}^{-1}$, DEX 10+ $A\beta_{25-35}$ 1, 5, 10 $\mu\text{mol}\cdot\text{L}^{-1}$ and DEX 5+ $A\beta_{25-35}$ 5 and 10 $\mu\text{mol}\cdot\text{L}^{-1}$ could decrease PC12 cells survival after 24 h treatment. While combination of DEX with $A\beta_{25-35}$ could significantly decrease PC12 cells number ($P<0.01$). DEX 5 $\mu\text{mol}\cdot\text{L}^{-1}$, $A\beta_{25-35}$ 1 $\mu\text{mol}\cdot\text{L}^{-1}$ could increase the apoptotic rate of PC12 cells. And DEX 5+ $A\beta_{25-35}$ 1 $\mu\text{mol}\cdot\text{L}^{-1}$ could

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significantly increase the apoptotic rate of PC12 cells ($P < 0.01$). Single DEX 5 or $A\beta_{25-35}$ $1 \mu\text{mol}\cdot\text{L}^{-1}$ had no significant effect on caspase 3 mRNA levels, but DEX $5 \mu\text{mol}\cdot\text{L}^{-1}$ + $A\beta_{25-35}$ $1 \mu\text{mol}\cdot\text{L}^{-1}$ could significantly increase caspase 3 mRNA levels. **CONCLUSION** Combination of DEX with $A\beta_{25-35}$ can significantly increase the injury and apoptosis in PC12 cells.

Key words [dexamethasone](#) [amyloid beta protein](#) [Alzheimer's disease](#) [apoptosis](#)

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