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论文

PCB153对INS-1细胞毒性作用及机制

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摘要:

目的 探讨2,2',4,4',5,5'-六氯联苯(PCB153)对体外培养胰岛β细胞株(INS-1)细胞毒性作用及机制。方法 PCB153设3个剂量组(1、3、6 μmol/L),二甲基亚砜(DMSO)为溶剂对照组,染毒INS-1细胞24 h后,检测细胞存活率、凋亡、活性氧(ROS)水平、Caspase 3 和Caspase 12等凋亡相关基因表达水平。结果 3、6 μmol/L PCB153剂量组细胞存活率分别为(80.9±8.7)% 和(42.2±4.3)%,与对照组比较均有下降(P<0.05);3 μmol/L PCB153剂量组ROS为(9.2±0.4)、凋亡率为(30.7±3.4)%,6 μmol/L PCB153剂量组ROS为(13.7±1.6)、凋亡率为(40.4±1.3)%,与对照组比较,ROS水平和细胞凋亡率均增加(P<0.05);与对照组比较,3 μmol/L PCB153剂量组Caspase 3及3、6 μmol/L PCB153剂量组Caspase 12基因表达水平均有增加(P<0.05)。结论 PCB153可诱导INS-1细胞凋亡,氧化应激和内质网信号通路可能参与PCB153对INS-1细胞的毒性作用。

关键词: 2,2’4,4,5,5’-六氯联苯(PCB153) INS-1细胞 细胞凋亡 活性氧

Toxic effect and its mechanism of PCB153 on INS-1 cells

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Abstract:

Objective To assess the toxic effect and its mechanism of 2,2',4,4',5,5'-hexachlorobiphenyl(PCB153) on pancreatic β-cell line(INS-1) cells.Methods INS-1 cells were exposed to PCB153(1,3,and 6 μmol/L) *in vitro*.Dimethyl sulfoxide(DMSO) was used as solvent control.After 24 hours,the rate of cellular survivors,percentage of apoptosis,intracellular reactive oxygen species(ROS) level,and expression levels of caspase 3 and caspase 12 genes were measured,respectively.Results Compared with the control group,the rate of cellular survivors in 3 μmol/L PCB153-treated group(80.9±8.7%) and 6 μmol/L PCB153-treated group(42.2±4.3%) were significantly decreased(P<0.05).The ROS levels and percentages of apoptosis in 3 μmol/L PCB153-treated group(fluorescence intensity:9.2±0.4,percentage of apoptosis:30.7±3.4%) and 6 μmol/L PCB153-treated groups(fluorescence intensity:3.7±1.6,percentage of apoptosis:40.4±1.3%) were notably higher than those of in the control group(P<0.05 for all).The expression levels of the caspase 3 in 6 μmol/L PCB153-treated group and caspase 12 in 3 μmol/L and 6 μmol/L PCB153-treated groups were significantly increased than those in the control group (P<0.05).ConclusionPCB153 may induce the apoptosis of INS-1 cells,and the oxidized stress and the endoplasmic reticulum signal passage may play an important role in the apoptosis induced by PCB153.

Keywords: PCB153 INS-1 cell cell apoptosis ROS

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