

论著

铅对发育期大鼠海马细胞凋亡的诱导和XIAP、Smac基因表达的影响

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摘要 背景与目的: 观察醋酸铅对发育期大鼠海马区细胞凋亡及其相关基因XIAP和Smac mRNA表达的影响, 以揭示铅的神经毒作用机制。材料与方法: 48只健康雄性1月龄SD大鼠, 被随机分为: 对照组(给予双蒸水灌胃6周), 实验组分别按低、中、高剂量, 依次给予2、20、200 mg/kg醋酸铅溶液灌胃6周。以石墨炉原子吸收法测血铅浓度; 用TUNEL法检测大鼠脑组织细胞凋亡的发生情况; 用RT-PCR检测海马细胞XIAP和Smac mRNA的表达。结果: 大鼠血液中的铅浓度随染铅浓度的增加而升高(P<0.01)。各醋酸铅剂量组大鼠海马组织凋亡细胞数量明显增加, 其凋亡指数显著高于对照组(P<0.01), 并且随染铅浓度的上升而增加; 大鼠海马组织的XIAP基因表达有下降趋势, 高铅剂量组显著低于对照组(P<0.01)。相关分析显示XIAP基因表达水平与血铅浓度呈负相关。各组大鼠海马组织的Smac基因表达水平无明显差别, 和血铅浓度也无相关性(P均<0.05)。结论: 铅可诱导发育期大鼠的海马细胞凋亡率上升, 该现象可能是通过抑制细胞XIAP基因的表达来发挥作用的。

关键词 [铅](#); [海马](#); [凋亡](#); [XIAP](#); [Smac](#)

Effect of Lead on Apoptosis and Expression of XIAP, Smac Genes in the Hippocampus of Developing Rats

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Abstract BACKGROUND AND AIM: To provide some scientific basis for the neurotoxic mechanism of lead, the present study examined the effect of lead acetate on apoptosis and expression of apoptosis-related genes XIAP and Smac in the hippocampus of developing rats. MATERIALS AND METHODS: Healthy male Sprague-Dawley rats(30 days old, n=48) were randomly divided into 4 groups with 12 rats in each group: distilled water negative control group, 2 mg/kg, 20 mg/kg, 200 mg/kg lead poisoning groups. Lead acetate was given through gastric feeding for 6 weeks. Lead concentration in the blood of the rats was determined by atomic absorption spectrophotometry. Apoptosis in the hippocampus was made by TUNEL. The expression of XIAP and Smac genes in the hippocampus was examined by RT-PCR. RESULTS: The blood lead concentration of the lead-exposure rat gradually increased with increasing level of lead exposure. TUNEL showed that there were significant differences between the four groups, and there was a significant dose-response relationship between the level of lead exposure and apoptosis. The expression of XIAP gene decreased in neurons of the hippocampus in high-lead treatment group compared with the control, but there were no differences in the expression of Smac gene among 4 groups. Correlation analysis demonstrated that lead concentration in blood correlated negatively with the expression of XIAP. CONCLUSION: Lead exposure resulted in significant increase of apoptosis of neurons. Lead-induced hippocampal neuronal apoptosis was related to down-regulation of the expression of XIAP gene.

Keywords [Lead](#) [hippocampus](#) [apoptosis](#) [XIAP](#) [Smac](#)

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